RECORD OF DECISION
FOR
3 SITE GROUP (SITES 118 [PICA-097], 131 [PICA-131] and 149 [PICA-149])

PICATINNY ARSENAL
NEW JERSEY

FINAL **JULY 2017**

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
µg/dL	micrograms per deciliter
µg/L	micrograms per liter
AA	Area of Attainment
ANL	Argonne National Laboratory
ARAR	Applicable or Relevant and Appropriate Requirement
ARCADIS	ARCADIS U.S., Inc.
ARDEC	Armament Research, Development and Engineering Center
Army	US Department of the Army
bgs	Below Ground Surface
BLL	Blood Lead Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Identification System
CEA	Classification Exception Area
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
DERP	Defense Environmental Restoration Program
DDT	Dichlorodiphenyltrichloroethane
DNT	Dinitrotoluene
ECC	Environmental Chemical Corporation
EC	Engineering Control
ERA	Ecological Risk Assessment
FFA	Federal Facility Agreement
FS	Feasibility Study
ft	foot/feet
ft^2	square foot/feet
GIS	Geographic Information System
HHRA	Human Health Risk Assessment
HI	Hazard Index
IC	Institutional Control
IRSL	Industrial Regional Screening Level
KVA	Kilovolt Amps

LOC	Level of Concern
LUC	Land Use Control
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
mg/kg	milligrams per kilogram
msl	Mean Sea Level
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
NRDCSRS	Non-Residential Direct Contact Soil Remediation Standards
O&M	Operations and Maintenance
OLEM	Office of Land and Emergency Management
PAERAB	Picatinny Arsenal Environmental Restoration Advisory Board
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
Picatinny	Picatinny Arsenal
PICA	Picatinny Arsenal
PP	Proposed Plan
PPE	Personal Protective Equipment
PRG	Preliminary Remediation Goal
RA	Response Action
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SCG	Site Cleanup Goal
SI	Site Inspection
SVOC	Semi-Volatile Organic Compound
TBC	To-Be-Considered
TCE	Trichloroethene
US	United States
USAEHA	United States Army Environmental Health Agency
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UU/UE	Unlimited Use/Unrestricted Exposure
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

WRA	Well Restriction Area
WWI	World War I
WWII	World War II

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1.0 PART 1: DECLARATION

1.1 SITE NAME AND LOCATION

Picatinny Arsenal (Picatinny) formally designated as United States (US) Department of the Army (Army), Installation Management Command, Northeast Region, Garrison Office, is located in north central New Jersey in Morris County near the city of Dover (**Figure 1**). Picatinny was included on the National Priorities List (NPL) in March of 1990 and assigned a Comprehensive Environmental Response, Compensation, and Liability Identification System (CERCLIS) number of NJ3210020704. The Army signed a Federal Facility Agreement (FFA) with the US Environmental Protection Agency (USEPA) in 1991. The Army, as the lead agency, selected this remedy in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, Executive Order 12580, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as required by the Defense Environmental Restoration Program (DERP).

This Record of Decision (ROD) addresses contaminated soil at three sites at Picatinny, located in Rockaway Township, Morris County, NJ (**Figure 1**). Generally, Picatinny sites have two numbers assigned to them. The "site" numbers are individual, unique identifiers for each site that were assigned during the Site Inspection (SI)/Remedial Investigation (RI) phase of work. The "PICA" numbers were assigned to individual sites or to groups of sites in order for the Army to track progress on environmental sites on a national basis in the Army Environmental Database –Restoration Module; therefore, several sites could have the same "PICA" number. This ROD generally uses the site number to identify the area being discussed; however, figures and tables may reference both numbers for consistency between documents.

To ensure that the areas with the greatest potential for environmental contamination were addressed first, the Army categorized the 16 parts of the base into Areas labeled A (greatest potential) through P (least potential). The Army further categorized these Areas into three phases (Area A was investigated separately). Phase I included Areas B though G, Phase II included Areas H through K, and Phase III included Areas L through P, as designated in the Argonne National Laboratory (ANL) Remedial Investigation Concept Plan (ANL, 1991).

The 3 sites addressed in this ROD are located as follows:

- Site 118/PICA-097 is situated in Area D, which is located in the west-central portion of Picatinny;
- Site 131/PICA-131 is situated in Area H, which is located in a small valley bounded to the west by Green Pond Mountain and to the east-southeast by a slightly elevated hill; and
- Site 149/PICA-149 is situated in Area I, which is located at the approximate center of Picatinny, and consists of Picatinny Lake and production and storage areas positioned on the shore around the lake.

1.2 STATEMENT OF BASIS AND PURPOSE

This ROD for three Picatinny sites presents the Response Action (RA) selected for the sites. The RA is selected in accordance with CERCLA, as amended by the SARA, and the NCP. The information supporting the decisions on the selected RA is contained in the administrative record file for the site. These decisions have been made by the Army and USEPA. Comments received from the New Jersey Department of Environmental Protection (NJDEP) were evaluated and considered in selecting the final RA, as well. NJDEP concurs with the selected RA, and a copy of the NJDEP concurrence letter for the Proposed Plan (PP), dated 12 November 2014, is included in Appendix F. A copy of the NJDEP concurrence letter for this ROD, dated 25 August 2017, is also included in Appendix F.

1.3 ASSESSMENT OF THE SITE

The RA selected in this ROD is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment at Site 118/PICA-097, Site 131/PICA-131, and Site 149/PICA-149.

1.4 DESCRIPTION OF THE SELECTED RESPONSE ACTION: REMOVAL, OFF-SITE DISPOSAL, AND LAND USE CONTROLS (LUCS)

The RA for soil at Site 118/PICA-097, Site 131/PICA-131, and Site 149/PICA-149, pursuant to this ROD, is part of a comprehensive environmental investigation and remediation process currently being performed at Picatinny. The remaining areas in Picatinny are being considered separately, and remedies for these areas are presented in separate documents. Groundwater at Site 131 is addressed by the Mid-Valley ROD (US Army, 2012). Similarly, groundwater at Site 118 is addressed in the Area D ROD (US Army, 2004a). The only site for which surface water and sediment samples were collected was Site 118; however, these media are addressed through the Green Pond Brook/Bear Swamp Brook ROD (US Army, 2004b).

Studies conducted at the Sites (118, 131, and 149), presented in **Table 1**, have shown various constituents present in soil at concentrations above the levels of concern (LOCs). **Table 2** summarizes maximum concentrations of the contaminants of concern (COCs) that exceeded LOCs in surface and subsurface soil samples collected at Sites 118/PICA-097, 131/PICA-131, and 149/PICA-149. LOCs are identified as site cleanup goals (SCGs) in the table. In discussions of surface and subsurface soil sample data, the surface zone is considered to be 0 to 2 feet (ft) below ground surface (bgs) and the subsurface zone greater than 2 ft bgs, in accordance with the *NJDEP Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria* (NJDEP, 2012).

The selected RA for contaminated soil at the sites is Removal, Off-Site Disposal, and Land Use Controls (LUCs). This RA consists of excavation and off-site disposal of soils that exceed the SCGs or drive unacceptable human health risks and hazards for the current and reasonably anticipated future land use (military/industrial). The excavations would be backfilled with clean (certified) backfill, compacted and vegetated as necessary to stabilize the site. LUCs will be needed to designate that the land use remain as military/industrial as the site does not meet

unlimited use/unrestricted exposure (UU/UE) conditions. LUCs would also prohibit the development and use of property for residential buildings, schools, childcare facilities and playgrounds. The Army is responsible for implementing, maintaining, reporting on and enforcing LUCs.

Initial excavations will be performed to the horizontal and vertical extents shown in **Figures 8, 9, and 10**. Following initial excavation activities, samples will be collected from the excavation walls and bottom and submitted for laboratory analysis. While awaiting laboratory confirmatory results, the excavations will be kept open. If one or more of the sidewall samples have results in exceedance of SCGs, additional soil will be excavated in the direction of the exceedance and confirmatory samples collected until the results are below SCGs. Then the excavation will be filled and vegetated.

If the excavation cannot continue due to an impediment (i.e. building foundation, utilities, a boulder/outcrop or groundwater causing undue difficulties to access, etc.) and the SCGs cannot be met, the resulting backfill will be maintained as a soil cover (an Engineering Control, or EC), as described in Section 2.9.4. If, based on the results from the post-excavation sampling, soil concentrations for all soil still present (not excavated) at the site above 10 ft bgs are below both the SCGs (non-residential) and the residential criteria, the site would qualify for UU/UE. If such should happen, details on this will be included and discussed within the site closure report.

Site cleanup goals, as presented in **Table 2**, are the NJDEP Non-Residential Direct Contact Soil Remediation Standards (NJDEP NRDCSRS). The NJDEP Residential Direct Contact Soil Remediation Standards are also provided within **Table 2**, for comparison purposes.

As noted above, LUCs will be implemented and maintained post-excavation to ensure that the remedy remains protective. These LUCs will designate that the land use remain as military/industrial use, prohibiting residential buildings, schools, childcare facilities and playgrounds, and will require annual monitoring to ensure the existing land use remains intact. If, within a reasonable effort to access, soil remains in place which exceeds cleanup goals, additional LUCs described for Alternative SL-2 would be implemented for maintaining the integrity of the cover, and annual monitoring will be conducted to ensure the integrity of the cover.

The selected RA presented in this ROD was selected over other RAs because it provides the best combination of primary balancing criteria, is protective of human health and the environment while meeting the CERCLA threshold criteria, and is compliant with Applicable or Relevant and Appropriate Requirements (ARARs) or To-Be-Considered (TBC) criteria in the absence of promulgated standards.

1.5 STATUTORY DETERMINATIONS

The selected RA satisfies the chemical and site-specific cleanup goals and complies with action- and location-specific ARARs. Chemical-Specific, Action-Specific, and Location-Specific ARAR and TBC Guidance are presented herein as **Tables 3, 4, and 5**, respectively. SCGs were selected for soil in the Sites 118, 131, and 149 Final Feasibility Study (FS) (ARCADIS, 2014a)

based primarily on the New Jersey soil cleanup criteria which were in effect at the time. As previously indicated, the SCGs are presented in **Table 2**. Additional details on the SCGs are presented in Section 2.7.4.

None of the contaminants that exceeded LOCs at Sites 118, 131, and 149 meet the criteria of principal threat waste. The selected RA was chosen after considering the balancing criteria such as short-term effectiveness, implementability, cost, and community acceptance.

If the selected RA results in contaminants remaining on-site above levels that do not allow for UU/UE, five-year reviews will be conducted in compliance with CERCLA and the NCP to ensure the remedy continues to be protective of human health and the environment.

1.6 DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary (Section 2) of this ROD. Additional information can be found in the Administrative Record for this site.

Criterion	**Section**	**Page No.**
Contaminants of concern and their respective concentrations	Table 2	NA
Baseline risk represented by the contaminants of concern (COCs)	2.7	2-12
Cleanup levels established for COCs and the basis for these levels	Table 2, 2.7.4	2-16
How source materials constituting principal threats will be addressed	2.11	2-26
Current and reasonably anticipated future land use assumptions used in baseline risk assessment and ROD	2.6	2-12
Potential land and groundwater use available as a result of the Selected Response Action (RA)	2.12.1, 2.13.1	2-27, 2-28
Estimated capital, annual operation and maintenance (O&M) and total present worth costs, and the number of years over which the RA cost estimates are projected	2.12.2	2-27
Key factors leading to selection of selected RA	2.12	2-27

NA – Not Applicable

1.7 AUTHORIZATION SIGNATURE

Jeffrey E. Ivey
Lieutenant Colonel, US Army
Commanding

26 July 2017
Date

John Prince, Acting Director for
Emergency and Remedial Response Division
United States Environmental Protection Agency, Region 2

September 15, 2017
Date

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2.0 PART 2: DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

This ROD describes the selected RA at Site 118/PICA-097, Site 131/PICA-131 and Site 149/PICA-149 located at Picatinny Arsenal in Rockaway Township, Morris County, New Jersey. Picatinny is an NPL site and is registered under CERCLIS number NJ3210020704. The Army is the lead agency for CERCLA actions at these sites, and USEPA Region 2 is the support agency with oversight responsibilities. In addition, plans and activities are also being coordinated with appropriate state agencies, including NJDEP.

Picatinny Arsenal is a 5,900-acre government-operated munitions research and development facility located in Morris County, New Jersey, approximately 40 miles west of New York City and four miles northeast of Dover, New Jersey. The Arsenal sits in the Highlands of the state of New Jersey (**Figure 1**).

This ROD addresses the RA for the sites as follows:

- Site 118/PICA-097 is situated in Area D, which is located in the west-central portion of Picatinny;
- Site 131/PICA-131 is situated in Area H, which is located in a small valley bounded to the west by Green Pond Mountain and to the east-southeast by a slightly elevated hill; and
- Site 149/PICA-149 is situated in Area I, which is located at the approximate center of Picatinny, and consists of Picatinny Lake and production and storage areas positioned on the shore around the lake.

The site locations within Picatinny Arsenal are presented in **Figure 1**, and the site layouts are presented in **Figure 2** (Site 118), **Figure 4** (Site 131)**,** and **Figure 6** (Site 149).

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.1 Picatinny Arsenal Background

Picatinny Arsenal was established in 1880 by the US War Department as a storage and powder depot. Later it was expanded to assemble powder charges for cannons and to fill projectiles with maximite (a propellant). During World War I (WWI), Picatinny produced all sizes of projectiles. In the years following WWI, Picatinny Arsenal began projectile melt-loading operations and began to manufacture pyrotechnic signals and flares on a production basis. During World War II (WWII), Picatinny Arsenal produced artillery ammunition, bombs, high explosives, pyrotechnics, and other ordnance. After WWII, Picatinny Arsenal's primary role became the research and engineering of new ordnance. However, during the Korean and Vietnam conflicts, Picatinny resumed the production and development of explosives, ammunition, and mine systems.

In recent years, Picatinny Arsenal's mission has shifted to conducting and managing research development, life-cycle engineering, and support of other military weapons and weapon systems. The facility has responsibility for the research and development of armament items. The Base Realignment and Closure process in 2005 resulted in Picatinny being designated to remain open and to expand in mission.

Picatinny is not closed to the public, but access to the Arsenal is strictly controlled. Trespassing and unauthorized activities on Picatinny are illegal. Picatinny has seven elements of site controls including Site Clearance and Soil Management Procedures; Munitions and Explosives of Concern Clearance Procedures; Master Plan Regulations; Picatinny Geographic Information System (GIS) Database; Picatinny Base Access Restrictions; Picatinny Safety Program; and Army Military Construction Program Development and Execution. These controls have been developed with consideration of all reasonably anticipated land uses at the Arsenal including administrative and industrial military operations and outdoor recreation/golf course. The Picatinny Office of the Chief of Security Division and the Public Safety and Environmental Affairs Division are in charge of enforcing these regulations.

2.2.2 Site Investigations

Previous environmental investigations conducted for the sites addressed in this ROD are listed in **Table 1**.

2.2.3 Enforcement Activities

No formal enforcement activities have been conducted for the three Picatinny sites. Picatinny is working in cooperation with the USEPA and the NJDEP to apply appropriate remedies that will preclude the necessity of formalized enforcement actions, such as Notices of Violation.

2.3 COMMUNITY PARTICIPATION

The three sites addressed in this ROD have been the topic of presentations at the Picatinny Arsenal Environmental Restoration Advisory Board (PAERAB). PAERAB members have provided comments regarding the selected RA. A copy of the Final PP (US Army, 2014) was given to the PAERAB's co- chair, and a copy was offered to all PAERAB members. The Final PP for these sites was completed and released to the public on August 28, 2014 at the information repositories listed below:

Installation Restoration Program Office
Building 319
Picatinny Arsenal, New Jersey 07806

Morris County Library
30 East Hanover Avenue
Whippany, New Jersey 07981

Rockaway Township Library
61 Mount Hope Road
Rockaway Township, New Jersey 07866

Multiple newspaper notifications were made to inform the public of the start of the PP comment period, to solicit comments from the public, and to announce the public meeting. The notification was run in the Daily Record on August 28, 2014 and the Star Ledger on September 3, 2014. Copies of the certificates of publication are provided in **Appendix A**. A public meeting was held on September 11, 2014 to inform the public about all of the remedial alternatives considered and the selected RA for the Sites 118, 131, and 149 at Picatinny and to seek public comments. At this meeting, representatives from the US Army, NJDEP, USEPA, and the Army's contractor, ARCADIS, were present to answer questions about the site and RAs under consideration. Following the public meeting, a public comment period was held from September 11, 2014 to October 11, 2014 during which written comments were received from NJDEP, and written comments were received from the public. Public comments and prepared responses from the public meeting are presented in Section 3.0 of this ROD.

2.4 SCOPE AND ROLE OF RESPONSE ACTION

This ROD documents the final RA for soil at three Sites (118/PICA-097, 131/PICA-131, and 149/PICA-149). The selected RA addresses the COCs which were identified in soil during previous investigations at the three sites (**Table 1**). The COCs are discussed in further detail in the following sections. The selected RA is designed to provide protection to human health and the environment in relation to both the current and anticipated future site use.

The RA selected for the remediation of contaminants at the three Sites is Removal, Off-Site Disposal, and LUCs. This RA consists of excavation and off-site disposal. Post-excavation sampling will be conducted and will determine the extent of the excavations at each site, as described in Sections 1.4 and 2.9.4. The selected RA also requires LUCs, which would entail performing any site maintenance required to maintain the protectiveness of the RA, such as maintenance of covers, if incomplete excavations occur, and maintaining administrative controls/institutional controls (ICs). LUCs would be maintained until contaminant levels are reduced to allow unrestricted use.

2.5 SITE CHARACTERISTICS

2.5.1 Physical Characteristics

Size, Topography, and Geology/Hydrogeology

Picatinny consists of 5,900 acres of improved and unimproved property. Picatinny is located in an elongated, U-shaped valley between Green Pond Mountain and Copperas Mountain to the northwest and an unnamed hill to the southeast. Most of the buildings and other facilities at Picatinny are located on the valley floor or on the slopes along the southeast side of the property. Several firing and testing ranges are located on Green Pond Mountain.

Picatinny lies within Green Pond Valley, a glaciated river valley bounded by Green Pond Mountain to the northwest and Copperas Mountain to the southeast. Elevations at Picatinny range from approximately 1,000 ft above mean sea level (msl) to 700 ft above msl at Green Pond Brook at the southern boundary. Green Pond Valley is filled with glacially-derived sediments

surrounded and underlain by bedrock. The basement rocks are faulted by a series of northeast/southwest trending faults.

The principal source of groundwater in the Green Pond Valley is found in the glacial deposits filling the valley floor. The low-permeability and the steep slopes of Green Pond Mountain and Copperas Mountain restrict infiltration of precipitation in these mountains. As a result, most precipitation flows overland and into the permeable valley fill deposits in the valley center. The small amount of precipitation that enters Green Pond and Copperas Mountains flows down through shallow fractures to the glacial sediments in the valley. Groundwater beneath Picatinny is classified as Class IIA (potable water or water potable after conventional treatment).

Climate

Northern New Jersey has a continental temperate climate controlled by weather patterns from the continental interior. Prevailing winds blow from the northwest from October to April and from the southwest from May to September. The average monthly temperature ranges from a high of about 72 degrees Fahrenheit (°F) in July to a low of about 27°F in January and February. The average date of the last freeze is May 2, and the average date of the first freeze is October 8. Average annual precipitation at the Boonton monitoring station located approximately five miles east of Picatinny is 48 inches and is evenly distributed throughout the year.

2.5.2 Summary of Site Information

The background information presented below for each of the individual sites addressed in this ROD is derived, modified, and summarized from the information presented in the FS (ARCADIS, 2014a), which summarizes the information from the documents listed in **Table 1** "Chronology of Environmental Investigations" and from the Final Remedial Investigation Concept Plan for Picatinny Arsenal. Site descriptions presented in this ROD were updated based upon information in the Army's current building use database. Much of the site background is the same information that was the basis of the follow-on site inspections, remedial investigations and removal actions. **Table 2** presents a summary of the COCs identified at each of the sites and identifies the maximum concentrations detected at each site. Historical soil, sediment, surface water, and groundwater results are provided in **Appendix B**. Pre-design soil data collected in 2016 are provided in **Appendix C**.

2.5.2.1 Site 118/PICA-097

Background

Site 118 is approximately 0.1 acres in size and includes Building 41. Site 118 is located at the eastern end of Dunn Avenue in the middle of the golf course. Building 41, constructed in 1956, is approximately 3,150 square feet (ft^2) and is a one-story hollow-tile wall building built on a concrete foundation. **Figure 2** shows the location and layout of Site 118. **Figure 3** shows the locations of samples collected at the site and which samples and data exceed the SCGs.

A historical Picatinny document indicates that prior to 1964, Building 41 was maintained by Picatinny's Supply Division and may have been used for storage. In 1964, this building was

reassigned to the Plant Engineering— Buildings, Roads, and Ground Branch for storage of fertilizer, lime, and miscellaneous inert materials. Up until recently, the building was predominantly used for storage of pesticides and herbicides, which were applied on the golf courses and the lawn surrounding Site 118.

According to Picatinny personnel, the roof of Building 41 has leaked during rainfall events over the years. Until 1988, it was reportedly a common occurrence for open bags of pesticides and herbicides stored at Building 41 to leak onto the floor. During a 2004 site reconnaissance, several holes were observed in the roof of Building 41. However, all pesticides and herbicides had been removed from the building, and the building is only used for the storage of golf course maintenance equipment and food processing equipment that were covered with plastic sheets.

The following environmental investigations were conducted at Site 118/PICA-097:

- 1986 United States Geological Survey (USGS) geophysical survey;
- Groundwater monitoring from 1982 through 1990;
- 1988 US Army Environmental Healthy Agency (USAEHA) Pesticide Risk Management Study;
- 1990 Chemical Waste Management pesticide study;
- 1997 Pesticide Evaluation of the Golf Course by USAEHA;
- 1998 Phase I RI (Dames and Moore, 1998);
- 2000-2001 Phase I 2A/3A RI (Shaw, 2005a); and
- 2016 delineation of COCs refinement study.

Summary of Site Investigation Findings Through 2001

In surface soils (samples collected between 0-2 ft bgs), two pesticides were detected at Site 118. Concentrations of 0.5 milligrams per kilogram (mg/kg) dieldrin (LOC = 0.2 mg/kg) and 0.53 mg/kg heptachlor epoxide (LOC = 0.3 mg/kg) were detected at location D-SS118-3, 0-0.5 ft bgs. Dieldrin and heptachlor epoxide were also detected in the sample from D-SS118-1, 0-0.5 ft bgs, at concentrations of 0.25 mg/kg and 0.77 mg/kg, respectively. A concentration of 0.34 mg/kg heptachlor epoxide was also detected in the sample from location D-SS118-2, 0-0.5 ft bgs.

Arsenic (LOC = 19 mg/kg) was detected in surface soil samples (0-1 ft) collected from nine locations, ranging in concentration from 20.6 mg/kg (D-118-SS-006, 0-1 ft bgs) to 162 mg/kg (D-118-SS-027, 0-1 ft bgs). Manganese (LOC = 5,900 mg/kg) and thallium (LOC = 79 mg/kg) were detected at concentrations of 13,000 mg/kg and 587 mg/kg, respectively, in sample D-SB118-1, 0-2 ft bgs. Lead (LOC = 800 mg/kg) was detected at 2,400 mg/kg in D-SS118-3, 0-0.5 ft bgs.

Please note that the NJDEP NRDCSRS for manganese (5,900 mg/kg), which was the source of the original LOC above, is based on inhalation risk calculations. As an inhalation-based standard is not applicable for the site, it was agreed upon during the public comment period stakeholder discussions (see Section 3.1) that the USEPA Industrial Regional Screening Level (IRSL) would be acceptable as a cleanup goal for the site. The current IRSL for manganese, based on the November 2015 revised values, is 26,000 mg/kg; however, for this ROD the SCG has been kept

at the value that was agreed upon during the PP period (23,000 mg/kg). For this reason, manganese is not retained as a contaminant of potential concern (COPC) for Site 118 and is not presented in **Table 2**.

No constituent concentrations were above LOCs in any subsurface soil samples (collected below 2 ft bgs).

Constituents in sediments at Site 118 are addressed as part of Region 3 in the Final ROD, Green Pond Brook/Bear Swamp Brook (US Army, 2004b), but the only sediment sample containing concentrations of multiple constituents that exceed LOCs was D-B-SB-SD-44. Nine SVOCs which exceeded the LOCs at this location include: acenaphthene (0.11 mg/kg; LOC = 0.00671 mg/kg), benzo(a)pyrene (0.49 mg/kg; LOC = 0.0319 mg/kg, benzo(b)fluoranthene (0.6 mg/kg; LOC = 0.0272 mg/kg), benzo(k)fluoranthene (0.3 mg/kg; LOC = 0.0272 mg/kg), fluoranthene (1.6 mg/kg; LOC = 0.6423 mg/kg), fluorine (0.18 mg/kg; LOC = 0.0212 mg/kg), indeno(1,2,3-c,d)pyrene (0.24 mg/kg; LOC = 0.078 mg/kg), phenanthrene (1.17 mg/kg; LOC = 0.0419 mg/kg), and pyrene (1.15 mg/kg; LOC = 0.053 mg/kg).

Seven pesticides exceeded LOCs at this sediment location: 0.03 mg/kg 4,4'-dichlorodiphenyldichloroethane (LOC = 0.00354 mg/kg), 0.18 alpha-chlordane (LOC = 0.0003 mg/kg), 0.16 mg/kg beta-BHC (LOC = 0.00094 mg/kg), 0.45 mg/kg dieldrin (LOC= 0.00285 mg/kg), 0.01 mg/kg endrin aldehyde (LOC = 0.00267 mg/kg), 0.49 mg/kg endrin ketone (LOC = 0.00267 mg/kg), and 0.47 gamma-chlordane (LOC= 0.0003 mg/kg).

Two dioxins, 1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin (LOC = 0.00085 mg/kg) and octachlorodibenzodioxin (LOC = 0.0085 mg/kg), and two Polychlorinated Biphenyls (PCBs), Aroclor 1248 (LOC = 0.0341 mg/kg) and Aroclor 1254 (LOC = 0.060 mg/kg), were detected in concentrations that exceeded sediment LOCs. Location D-SB-SD-44 had concentrations of 0.11 mg/kg 1,2,3,4,6,7,8- heptachlorodibenzo-p-dioxin; 0.24 mg/kg octachlorodibenzodioxin; 0.18 mg/kg Aroclor 1248; and 0.3 mg/kg Aroclor 1254.

Seven metals were detected at sediment sample D-B-SB-SD-44. The concentrations were: 29.8 mg/kg cadmium (LOC = 1.7 mg/kg); 118 mg/kg chromium (LOC = 37.3 mg/kg); 150 mg/kg copper (LOC = 28 mg/kg); 58.6 mg/kg lead (LOC = 38.8 mg/kg); 0.49 mg/kg mercury (0.249 mg/kg); 7.53 mg/kg silver (LOC = 1 mg/kg); and 360 mg/kg zinc (LOC = 171 mg/kg).

Constituents in groundwater at Site 118 are addressed under the Final ROD, Area D Groundwater (US Army, 2004a). In groundwater, the volatile organic compound (VOC) trichloroethene (TCE) (LOC = 1 microgram per liter [µg/L]) was detected at concentrations greater than the LOC at two locations, D-MW-1 and D-MW118-1, with maximum concentrations of 5.1 µg/L and 8.6 µg/L, respectively, collected in April 1994. A concentration of 0.33 µg/L 4,4'- dichlorodiphenyltrichloroethane (DDT) (LOC = 0.1 µg/L) was detected at location D-MW-1 in October 1993. Six metals have been detected in at least one groundwater sample with maximum concentrations of 2,020 µg/L iron (LOC = 300 µg/L), 27.1 µg/L lead (LOC = 5 µg/L), 81,000 µg/L sodium (LOC = 50,000 µg/L) and 84,000 µg/L dissolved sodium detected at D-MW-1. Maximum concentrations of 8.19 µg/L arsenic (LOC = 3 µg/L), 5.68 µg/L

dissolved arsenic, and 2.58 µg/L beryllium (LOC = 1 µg/L) were detected in groundwater collected at D-I-2.

COC Delineation Refinement Study - 2016

The COC Delineation Refinement sampling program was performed at Site 118 on March 29, 2016, in accordance with the Final 3 Site Group Work Plan (ECC, 2015), to refine delineations of COCs in soil at Site 118. Data Summary Tables for the 2016 COC Delineation Refinement Study are presented in **Appendix C**.

Samples were collected in the areas of previously identified COC exceedances at nine locations (D-118-SS-020 through D-118-SS-028) at depths of 0-0.5, 1-2, 4-5, and 9-10 ft bgs. The samples collected from 0-0.5 and 1-2 ft bgs were submitted for immediate analysis, with the remaining depths held pending the initial results. All samples were analyzed for pesticides dieldrin and heptachlor epoxide and for metals arsenic, lead, and thallium. Based upon the initial result for arsenic, one sample (D-118-SS-020) collected from the 4-5 ft bgs was analyzed for metals arsenic, lead, and thallium. As noted above, because the maximum concentration of manganese detected at Site 118 is less than the cleanup goal, manganese is not identified as a COC in this ROD, and samples collected as part of the 2016 delineation refinement study were not analyzed for manganese.

Neither dieldrin nor heptachlor epoxide was detected in any of the soil samples analyzed. Lead was detected in all 19 of the samples analyzed, at a maximum concentration of 228 mg/kg, all results below the LOC of 800 mg/kg. Thallium was detected in one of the 19 samples analyzed, at a concentration of 9.60 mg/kg, below the LOC of 79 mg/kg.

Arsenic was detected in all 19 samples analyzed, 9 of which results were above the 19 mg/kg LOC. Results in exceedance of the LOC for arsenic were as follows: D-118-SS-020, 1-2 ft bgs (33.0 mg/kg); D-118-SS-021, 0-0.5 ft bgs (24.6 mg/kg); D-118-SS-022, 0-0.5 ft bgs (47.2 mg/kg and 31.4 mg/kg field duplicate); D-118-SS-024, 0-0.5 ft bgs (30.2 mg/kg); D-118-SS-025, 0-0.5 ft bgs (37.0 mg/kg); D-118-SS-026, 0-0.5 ft bgs (32.1 mg/kg); D-118-SS-027, 0-0.5 ft bgs (162 mg/kg); and D-118-SS-028, 0-0.5 ft bgs (63.1 mg/kg). All arsenic results for soil depths collected below these intervals were below the 19 mg/kg LOC.

No results for arsenic, lead, or thallium analyzed in the subsurface samples (4-5 ft bgs) were above LOCs. Sampling results in exceedance of SCGs at Site 118 for the 2016 delineation refinement study, as well as for historical sampling events, are depicted in **Figure 3**.

2.5.2.2 Site 131/PICA-131

Background

Site 131 is approximately 1.2 acres in size. Building 266, a former ordnance manufacturing facility on Site 131, was originally constructed in 1903 and has a concrete foundation, brick piers, brick load-bearing walls with four truck-loading dock doors, and a corrugated asbestos roof. Building 266 served as an explosives production facility from the time of its construction until the early 1950s. Explosives production ceased here sometime before 1953, when the

building was converted to its current use as a wind tunnel research facility. The wind tunnel research facility has been used to simulate and study the flight characteristics of small projectiles. **Figure 4** shows the location and layout of Site 131. **Figure 5** shows the locations of samples collected at the site and which exceed the SCGs.

The types of material used and/or wastes generated from explosives production operations are not known, except for Class 7 pyrotechnic compositions. However, based on the knowledge of explosives operations in Area H, materials used and/or derivative wastes generated in appreciable quantities would likely have included scrap explosives waste and possibly pyrotechnics, solvent contaminated rags, and explosives-contaminated wastewater. All of the waste materials, except for the explosives-contaminated wastewater, were generally placed in red cans and disposed of at the Picatinny Burning Ground.

Materials known to be used in wind tunnel operations included compressor oils, lubricating oils, and uranium-containing valves and gauges. Picatinny personnel indicated that operation of the wind tunnel has resulted in the generation and dispersion of mercury condensate in and around the wind tunnel exhaust area. The mercury release within and around the wind tunnel exhaust area was the subject of a previous investigation within the building interior, and these mercury impacts identified within the building structure have been removed.

Oil-contaminated wastewater generated by wind tunnel activities at Building 266 was conveyed to an oil-water separator and discharged to Bear Swamp Brook in the past. The oil-water separator is known to have malfunctioned on at least one occasion, and untreated wastewater was discharged directly to Bear Swamp Brook. Surface water and sediment for Bear Swamp Brook have been investigated and are being addressed separately as part of the Green Pond Brook/Bear Swamp Brook ROD. According to Picatinny personnel, wastewater from the building presently discharges to the sanitary sewer while all remaining wastes are disposed of offsite.

Four 75-kilovolt amps (KVA) and two 200-KVA pad-mounted transformers (TR-266) were located on the west side of Building 266. According to the Picatinny transformer database, all of the transformers were in fair to good condition and did not contain PCB oils. All six transformers were removed in the 1990s as part of a facility-wide transformer removal action.

An internal investigation and several isolated sampling events were conducted at Site 131 prior to the Phase II RI. These sampling events include:

- 1988 internal investigation of stained soil from a leaky air compressor;
- 1991 soil sampling around Building 266;
- 1991 Armament Research, Development and Engineering Center (ARDEC) Discharge Investigation;
- 1992 Internal Investigation for an accidental spill of mercury;
- 1992 radiation survey of Building 226;
- 1995-2000 Phase II RI, Rounds 1 and 2 (Shaw, 2005b); and
- 2016 delineation of COCs refinement study.

Summary of Site Investigation Findings Through 2000

Polynuclear (or polycyclic) aromatic hydrocarbons (PAHs), a subset of semi-volatile organic compounds (SVOCs), were detected in concentrations greater than the LOCs in three surface soil samples (samples collected between 0-2 ft bgs) at Site 131, locations H-131-SS-005C, H-131-SS-007, and H-131-SS-008. Benzo(a) pyrene (LOC = 0.2 mg/kg) was detected in samples collected at all three locations; 4 mg/kg at H-131-SS-005C, 0.23 mg/kg at H-131-SS-007, and 0.27 mg/kg in the duplicate sample at H-131-SS-008 (below LOC at 0.18 mg/kg in primary sample). Concentrations of 4 mg/kg benzo(a)anthracene (LOC = 2 mg/kg) and 4 mg/kg benzo(b)fluoranthene (LOC = 2 mg/kg) were also detected at sample location H-131-SS-005C. Arsenic (LOC = 19 mg/kg) was detected at concentrations greater than the LOC in surface soil samples from 10 of 11 sample locations. Concentrations of arsenic ranged from 13.7 mg/kg (location H-131-SS-010A) to 1,440 mg/kg (location H-131-SS-013).

In subsurface soils (collected below 2 ft bgs), one sample, H-131-SB-002, 2-3 ft bgs, had a concentration of 23.5 mg/kg arsenic (LOC = 19 mg/kg).

Constituents in groundwater at Site 131 are addressed under the Final Mid-Valley Groundwater ROD (US Army, 2012). TCE (LOC = 1 µg/L) was detected in groundwater samples from two sample locations: 1.6 µg/L TCE was detected at location H-131-HP-003 (November 2000), and concentrations of 2.7 µg/L (October 1996), 3 µg/L (December 2000), 2.1 µg/L (February 2002), and 3.7 µg/L (November 2003) were detected at location H-131-MW-003. It should be noted that the USEPA Maximum Contaminant Level (MCL) for TCE is 5.0 µg/L, and all results for TCE in groundwater have been below that value. No TCE concentrations have been historically detected above laboratory reporting limits (TCE reporting limit=0.28 mg/kg for all samples, well below the LOC of 20 mg/kg) in any Site 131 soil samples, indicating that TCE concentrations in groundwater are unrelated to Site 131 historical activities.

The only other constituents detected in groundwater at concentrations greater than the LOCs included 521 µg/L aluminum (LOC = 200 µg/L) and 6.07 µg/L arsenic (LOC = 3 µg/L), detected in groundwater sampled from monitoring well H-131-MW-001 in October 1996.

COC Delineation Refinement Study - 2016

The COC Delineation Refinement sampling program was performed at Site 131 on March 30, 2016, in accordance with the Final 3 Site Group Work Plan (ECC, 2015), to refine delineations of COCs in soil at Site 131. Data Summary Tables for the 2016 COC Delineation Refinement Study are presented in **Appendix C**.

Samples were collected in the areas of previously identified COC exceedances at seven locations (H-131-SS-014 through H-131-SS-020) at depths of 0-0.5, 1-2, 4-5, and 9-10 ft bgs, with one collected from 7.5-8 ft bgs at H-131-SS-015. The samples collected from 0-0.5 and 1-2 ft bgs were submitted for immediate analysis, with the remaining depths held pending the initial results. All samples were analyzed for PAHs benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene and for the metal arsenic. Based upon the initial results for arsenic, three samples (H-131-SS-016, H-131-SS-017, and H-131-SS-020) collected from the 4-5 ft bgs

interval were analyzed for arsenic. Based upon the initial results for PAH analysis, two samples (H-131-SS-018 and H-131-SS-020) collected from the 4-5 ft bgs interval were also analyzed for the three select PAHs.

PAHs were detected in concentrations greater than the LOCs in three surface soil samples at Site 131, at locations H-131-SS-018 and H-131-SS-020. Benzo(a)pyrene (LOC = 0.2 mg/kg) was detected in samples collected at H-131-SS-018, 0-0.5 ft bgs and 1-2 ft bgs, at 0.223 and 2.41 mg/kg, respectively, and H-131-SS-020, 1-2 ft bgs, at 0.325 mg/kg. Concentrations of 3.02 mg/kg benzo(a)anthracene (LOC = 2 mg/kg) and 3.11 mg/kg benzo(b)fluoranthene (LOC = 2 mg/kg) were detected at sample location H-131-SS-018, 1-2 ft bgs.

Arsenic was detected in all 17 samples analyzed (plus field duplicate), 8 of which results were above the 19 mg/kg LOC. Results in exceedance of the LOC for arsenic were as follows: H-131-SS-16, 0-0.5 ft bgs and 1-2 ft bgs (121 and 79.7 mg/kg, respectively); H-131-SS-17, 0-0.5 ft bgs and 1-2 ft bgs (25.6 and 24.7 mg/kg, respectively); H-131-SS-18, 0-0.5 ft bgs, primary and field duplicate samples (32.1 and 28.4 mg/kg, respectively); H-131-SS-19, 0-0.5 ft bgs (23.1 mg/kg); and H-131-SS-20, 0-0.5 ft bgs and 1-2 ft bgs (69.4 and 108 mg/kg, respectively). All arsenic results for the deeper soil intervals were below the 19 mg/kg LOC.

No results for PAHs or arsenic analyzed in subsurface samples collected 4-5 ft bgs were above LOCs.

2.5.2.3 Site 149/PICA-149

Background

Site 149/PICA-149 is located along the southeast shore of Picatinny Lake. The site covers 0.8 acres of forested habitat. Building 541 was a rectangular structure formerly located on the eastern shore of Picatinny Lake. The building was constructed in 1943 to perform the water drying process to harden explosive powder grains. Operations ceased in the mid-1950s, and the building was used to house two Plymouth gas locomotives during the 1960s. Building 541 was demolished in 1983. **Figure 6** shows the location and layout of Site 149. **Figure 7** shows the locations of samples collected at the site and which exceed the SCGs.

During its use as a water-drying process facility, Building 541 received shipments of explosive powder transported by railroad from Building 533. The explosive powder was unloaded inside the building. An elevator was used to hoist the powder to 12 wooden cypress tanks, where the water drying process hardened the grains and removed excess solvents. The water and powder mixture was discharged from the tanks directly into carts. These carts moved on a small interior tracking system that ran the length of the building. Screening to remove foreign objects or large clumps concluded this phase of processing.

Picatinny Arsenal personnel reported that a vat in Building 541 ruptured, causing liquid containing propellant to leak onto the building floor and to the outside area. The solution was reported to be single-base propellant grains dissolved in solvents. The energetic compounds were nitrocellulose and/or nitroglycerine. The solvents were ether, alcohol, and/or acetone.

Except for the Phase II RI (Shaw, 2005c), no previous studies have been conducted at Building 541. The initial Phase II RI sampling activities (Round 1) at Site 149 were conducted between April 1996 and October 1996. Subsequent soil sampling was performed in 2001 and 2002.

Summary of Site Investigation Findings Through 2002

As has been summarized in the Phase II RI report, five PAHs exceeded the LOCs in the surficial soil sample collected in the soil boring for monitoring well I-149-MW-002: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene, and one PAH, benzo(a)pyrene, exceeded the LOC at 5-7 ft bgs. In addition, one PAH, benzo(a)pyrene, exceeded the LOC in the surficial soil collected at I-149-MW-001, and also in the sample collected at 5-7 ft bgs. All soil samples for these borings were collected during monitoring well installation in 1996. Data collected from these wells in 1996 were discussed within the Final FS and included within the 2005 human health risk assessments (HHRA), as summarized in the FS (no VOCs, SVOCs, explosives, metals, or anions were detected at concentrations greater than their respective LOCs in groundwater). Monitoring wells MW-001 and MW-002 are located approximately 625 ft and 555 ft southwest of former site Building 541, respectively. Given that the carcinogenic risk was driven by 2,4-Dinitrotoluene (DNT), and the distance of these wells in relation to the 2,4-DNT and PAH-impacted former site building area, the Area of Attainment (AA) for Site 149, as identified in the FS and PP, did not include the two wells.

Within the Site 149 area, PAHs were detected in concentrations greater than the LOCs in five surface soil samples at Site 149, at locations I-149-SB-001, I-149-SS-001, I-149-SS-002 (primary and field duplicate), I-149-SS-003, I-149-SS-004, and I-149-SS-008. The maximum concentrations for all five PAHs were detected at location I-149-SS-002: 26.7 mg/kg benzo(a)anthracene (LOC = 2 mg/kg), 36.0 mg/kg benzo(a)pyrene (LOC = 0.2 mg/kg), 73.7 mg/kg benzo(b)fluoranthene (LOC = 2 mg/kg), 7.19 mg/kg dibenz(a,h)anthracene (LOC = 0.2), and 24.9 mg/kg indeno(1,2,3-c,d)pyrene (2 mg/kg). The explosive constituent 2,4-DNT (LOC = 3.0 mg/kg) was detected at concentrations greater than the LOC in both the surface soil (0-2 ft bgs) and subsurface soil (5-7 ft bgs) samples from I-149-SB-002, at concentrations of 630 mg/kg and 10.3 mg/kg, respectively.

Nitrocellulose was also detected in surface soil samples. No LOC has been established for this compound. Nitrocellulose has been evaluated to have little toxicity for most aquatic species and is virtually non-toxic to humans and mammals. The explosive constituent 2,4,6-trinitrotoluene was also detected in surface soil samples but at levels less than the LOC.

No metals, pesticides, PCBs, cyanide, or anions were detected at concentrations greater than their respective LOCs in surface or subsurface soils. No VOCs, SVOCs, explosives, metals, or anions were detected at concentrations greater than their respective LOCs in groundwater.

COC Delineation Refinement Study - 2016

The COC Delineation Refinement sampling program was performed at Site 149 on March 28, 2016, in accordance with the Final 3 Site Group Work Plan (ECC, 2015), to refine delineations

of COCs in soil at Site 149. Data Summary Tables for the 2016 COC Delineation Refinement Study are presented in **Appendix C**.

Samples were collected in the areas of previously identified COC exceedances at eight locations at various depths: I-149-SS-009 (0-0.5, 3-4, and 9-10 ft bgs); I-149-SS-010 (0-0.5, 1-2, 4-5, and 9-10 ft bgs); I-149-SS-011 (0-0.5, 1-2, 4-5, and 9-10 ft bgs); I-149-SS-012 (0-0.5, 1-2, 4-5, and 9-10 ft bgs); I-149-SS-013 (0-0.5, 1-2, and 4-5 ft bgs); I-149-SS-014 (0-0.5, 1-2, 4-5, and 9-10 ft bgs); I-149-SS-015 (0-0.5, 1-2, 4-5, and 5-10 ft bgs, with field duplicate for 0-0.5 ft sample); and I-149-SS-016 (0-0.5, 1-2, 4-5, and 8-10 ft bgs). The samples collected from 0-0.5 and 1-2 ft bgs (or 0-0.5 and 3-4 ft bgs, in the case of I-149-SS-009) were submitted for immediate analysis, with the remaining depths held pending the initial results. All samples were analyzed for PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene and for the explosive 2,4-DNT.

No 2,4-DNT was detected above the LOC (3.0 mg/kg) in any surface soil samples (0-0.5 or 1-2 ft bgs) or the subsurface soil sample (3-4 ft bgs) analyzed in March 2016. Based upon the initial results for 2,4-DNT, no additional sample intervals were requested for analysis.

Based upon the initial PAH results, seven samples collected from the 4-5 ft bgs interval were analyzed for PAHs: I-149-SS-010; I-149-SS-011; I-149-SS-012; I-149-SS-013; I-149-SS-014; I-149-SS-015; and I-149-SS-016. No results for PAHs analyzed in the subsurface samples were above LOCs.

Those locations which had PAHs detected above LOCs ranged from one PAH (benzo[a]pyrene) at I-149-SS-009, I-149-SS-010, I-149-SS-015, and I-149-SS-016, up to all five PAH COCs at I-149-SS-012, and I-149-SS-013. One or more PAH was detected above LOCs in all eight 0-0.5 ft surface soil samples, and in seven of the eight 1-2 ft surface soil samples collected at Site 149. The 4-5 ft intervals were requested for analysis for all seven of the 1-2 ft locations (as listed above). See **Figure 7** for presentation of exceedances for all samples collected at Site 149.

The maximum concentrations for the five PAHs were detected at I-149-SS-012, 1-2 ft bgs: 26.7 mg/kg benzo(a)anthracene (LOC = 2 mg/kg), 36.0 mg/kg benzo(a)pyrene (LOC = 0.2 mg/kg), 73.7 mg/kg benzo(b)fluoranthene (LOC = 2 mg/kg), 7.19 mg/kg dibenz(a,h)anthracene (LOC = 0.2 mg/kg), and 24.9 mg/kg indeno(1,2,3-c,d)pyrene (LOC = 2 mg/kg). It should be noted that, while at most locations the PAHs were higher at the 0-0.5 ft bgs interval, I-149-SS-012 was the exception, with higher concentrations exhibited at the 1-2 ft bgs interval. However, the PAHs at the 4-5 ft bgs interval at location I-149-SS-012 were all non-detect.

2.6 CURRENT AND POTENTIAL FUTURE LAND USE

The Picatinny Arsenal Master Plan designates future use of Areas D, H, and I in line with current use as military and industrial conducted in a secured area. There are no plans to change this land-use in the foreseeable future.

2.7 SUMMARY OF SITE RISKS

Baseline HHRA and lead blood models (for sites where lead was present) were conducted for the 3 Site Group sites as part of the various RIs that evaluated these sites. Additional evaluation/reevaluation of some of the HHRA/lead blood levels was conducted for some of the sites since the RI due to the availability of revised/current toxicity values. As discussed previously, the sites are currently used for military/industrial purposes with no plans to change the use in the foreseeable future. A summary of the most recent risk assessment results for Sites 118, 131, and 149, as previously presented within the Sites 118, 131, and 149 Final FS, is presented in **Table 3**.

The risk assessments were conducted to evaluate the potential risk associated with exposure to chemicals in soil, sediment, groundwater, and surface water. Risks were calculated for the reasonably anticipated future use as well as hypothetical use scenarios. Potential receptors considered during the risk evaluations for current and future exposure scenarios at the 3 Site Group sites were the industrial/research worker and the construction excavation/worker. Although other receptors, including the on-site visitor, the adult resident, the child resident and the combined adult and child resident were considered at some Picatinny sites, these scenarios were not included within many of the Picatinny sites, including those of the 3 Site Group, because they are not reasonably anticipated future use scenarios.

The habitat at Site 131 is marginal for ecological receptors because the site is dominated by Building 266. However, because the site adjoins a forested area, the site was evaluated in the Phase II ecological risk assessment (ERA) along with adjacent Site 64. A preliminary ERA was conducted at Site 118 as part of the Phase II Investigation; based on the results (as discussed below), a baseline ERA was deemed unnecessary. A Phase II ERA was not conducted at Site 149, as no surface water, sediment or surface soil samples were collected at the site during the Round 1 investigation. However, Site 149 has similar habitat as nearby Sites 113, 148, and 178. Information on this ERA and how it relates to Site 149 is presented below.

A Baseline ERA was specifically prepared to evaluate risks to the Indiana Bat from exposures to site-related contaminants. This assessment was not related to a specific location or area, but rather dietary exposure for this species were estimated based on surface water data and tissue concentrations measured in emergent insects (e.g., Caddis flies) collected from a number of water bodies at Picatinny, including Picatinny Lake. Based on these data, the study concluded that no adverse effects to the bats were expected to result from site conditions at Picatinny (Shaw, 2003).

A summary of the results of the HHRAs, the lead blood model performed for Site 118, and the ERA/ecological risk evaluations are included below for each of the sites evaluated within this ROD.

2.7.1 Site 118/PICA-097

Estimated cancer risks and noncancer hazards quantified for realistic exposure scenarios at Site 118 were presented within the Phase I RI Report (Dames and Moore, 1998). Risk reevaluations

were performed in 2009 for several sites, including Site 118, due to the availability of revised/current toxicity values. The memorandum summarizing the results of this risk reevaluation was presented as Attachment C to the Sites 118, 131, and 149 FS (ARCADIS, 2014a). COPCs selected for Site 118 included four COPCs in surface soil and four COPCs in total soil (arsenic, lead, manganese, and thallium). There were no surface water, sediment, or groundwater data for the site. The cancer risk driver for both industrial/research worker (surficial soil) and construction worker (total soil) was arsenic. Based on the risk assessments performed for this site, for current and reasonably anticipated future use:

- The carcinogenic risk range is within the generally acceptable range of 1E-04 and 1E-06.

- The noncarcinogenic hazard index (HI) values were 10 for the industrial/research worker (surficial soil) and 86 for the construction worker (total soil), both driven by thallium and manganese. The industrial/research worker HI of 10 is primarily associated with ingestion of thallium and inhalation of manganese from surface soil. The construction worker HI of 86 is primarily associated with ingestion of thallium and ingestion and inhalation of manganese from surface soil. However, as previously discussed, the manganese 'exceedance' in surficial soil is considered acceptable, based upon the Manganese Cleanup Goal.

- Although the adult lead model results calculated in 2005 as part of the Site 118 RI concluded that lead is not a concern at this site (Shaw, 2005a), the conclusion was based on a currently out-of-date lead PRG. Based on this concern, the exceedances of the 800 mg/kg LOC identified in surficial soil, the other COCs identified, and the planned removal activities, lead has been included as a COC for Site 118.

- The preliminary ERA conducted as part of the Phase I Investigation suggested a potential risk to avian species due to metals and 4,4'-dichlorodiphenyltrichloroethane concentrations; however, site use (golf course, with regular mowing) limits formation of wildlife habitat at this site. Therefore, potential for significant exposure was determined to be limited and a baseline ERA was deemed unnecessary.

2.7.2 Site 131/PICA-131

Estimated cancer risks and noncancer hazards quantified for realistic exposure scenarios at Site 131 based on the HHRA approach were presented within the Phase II RI Report (Shaw, 2005b). Risk reevaluations were performed in 2009 for several sites, including Site 131, due to the availability of revised/current toxicity values. The memorandum summarizing the results of this risk reevaluation was presented as Attachment C to the Sites 118, 131, and 149 FS (ARCADIS, 2014a). COPCs selected for Site 131 included five COPCs in surface soil (arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and mercury), one COPC in subsurface soil (arsenic), and six COPCs in groundwater (ammonia, aluminum, arsenic, chromium, chloroform, and TCE). The cancer risk drivers for industrial/research worker (surficial soil) included arsenic, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene. The cancer risk driver for construction/excavation worker (total soil) was arsenic. Based on the risk assessments performed for this site for current and reasonably anticipated future use:

- The carcinogenic risk is within or less than the generally acceptable range of 1E-04 and 1E-06, except for industrial/research worker site use which attained a carcinogenic risk value of 2E-04 driven by arsenic in surface soil;

- The noncarcinogenic hazard is less than 1;

- Lead is not a concern at this site (i.e., did not screen in above levels of concern); and

- The Phase II ERA identified elevated concentrations of PAH, arsenic, and beryllium in the soil bioassay (conducted on soil collected from H-64-SS-3); however, results from a toxicity bioassay and environmental effects quotients study deem there is minimal risk to populations of terrestrial receptors (Shaw, 2005b).

2.7.3 Site 149/PICA-149

Estimated cancer risks and noncancer hazards quantified for realistic exposure scenarios at Site 149 based on the HHRA approach were presented within the Phase II RI Report (Shaw, 2005c). COPCs selected for Site 149 included nine COPCs in surface soil (ammonia, arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, 2,4-DNT, indeno(1,2,3-cd)pyrene, and mercury) and four COPCs in groundwater (ammonia, arsenic, benzo(a)anthracene, and mercury). The cancer risk drivers for industrial/research worker (surficial soil) included 2,4-DNT, arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. There were no cancer risk drivers for construction/excavation worker (total soil). Based on the risk assessments performed for this site, for current and reasonably anticipated future use:

- The carcinogenic risk range is within the generally acceptable range of 1E-04 and 1E-06, except for industrial/researcher worker site use, which attained a carcinogenic risk value of 2E-04 driven by 2,4- DNT;

- The noncarcinogenic hazard is less than or equal to 1;

- Lead is not a concern at this site (i.e., did not screen in above levels of concern); and

- As noted above, this site was not evaluated as part of the Phase II ERA, but based on risk analyses completed for other nearby sites with a similar habitat, there is little potential ecological risk at this site. Similar habitat equates to demolished former buildings (grassy field) bordered by mature trees with a nearby water body (Picatinny Lake).

  With the demolition of Building 541, Site 149 has reverted back to its natural state and is essentially an open grassy field bordered by mature trees and Picatinny Lake. Site 149 has a similar habitat and contaminant profile to the other sites assessed for ecological risk (113, 148, and 178). Based on the risk analysis performed for those nearby sites with similar habitat (Sites 113, 148, and 178), there is little potential risk to small mammals, vermivorous birds, and predatory birds from soil exposure at the site (Shaw, 2005c). Sites 113, 148, and one of the Site 178 areas are all located adjacent to the southeast side

of Picatinny Lake. Though slight differences may exist between Site 149 and the above referenced sites, the remedial activity at Site 149 should limit any ecological risks for the site's future.

2.7.4 Contaminants of Concern and Site Cleanup Levels

As part of the Final FS (ARCADIS, 2014a), the contaminants detected in each media at the sites were screened to identify COCs. The screening process is described in detail in Section 4.4 of the FS. In summary, COCs are defined as contaminants that:

1) Contribute to the majority of site-specific human health or ecological risk based on the HHRA or ERA; or

2) Exceed the LOC values determined for that media.

COCs identified for each of the three sites are identified as follows:

- Site 118/PICA-097 – thallium, manganese, arsenic, lead, dieldrin, and heptachlor epoxide;

- Site 131/PICA-131 – arsenic and PAHs (benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene); and

- Site 149/PICA-149 – 2,4-DNT and PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-c,d)pyrene).

The NJDEP NRDCSRS are identified as ARARs unless the NRDCSRS is based on inhalation risk calculations (such as the NRDCSRS for manganese). **Table 2** presents the analytes above SCGs established for COCs. As the single manganese result above the LOC (at Site 118) was below the SCG established for that metal, manganese is not included in **Table 2**.

As shown in **Table 2**, the SCG for lead (the NJDEP NRDCSRS) is 800 mg/kg and the NJDEP Residential Direct Contact Soil Remediation Standard for lead is 400 mg/kg. However, as provided in USEPA Office of Land and Emergency Management (OLEM, previously OSWER until December 2015) Directive 9200.2-167, recent toxicological studies on lead suggest that adverse health effects are associated with mean Blood Lead Levels (BLLs) less than 10 micrograms per deciliter (µg/dL) in children. In response to the directive, the Region has developed a tiered approach for evaluating the extent of lead contaminated soil requiring a remedial action. The strategy is based on an updated regional risk reduction goal of no more than 5% of the target population exceeding a BLL of 5 µg/dL. Using the default Integrated Exposure Uptake Biokinetic parameters and a target BLL of 5 micrograms per deciliter µg/dL yields a value of 200 parts per million (ppm).

To form a remedial strategy comprising both the state requirement of 400 mg/kg and recent toxicological findings reflecting the risk reduction goal stated above, a tiered approach is used to evaluate the extent of lead-contaminated soil requiring remedial action under residential cleanups. Specifically, individual detections of lead exceeding 400 mg/kg in surface soil (0-2 ft

bgs) are evaluated as an initial preliminary remediation goal (PRG). Subsequently, the average lead concentration within the top two feet across the remediated area, calculated consistent with OSWER 9200.1-78, must be at or below 200 mg/kg once the selected remedial action targeting detections above 400 mg/kg is complete. Lead concentrations in clean backfill should not exceed 200 ppm. This evaluation accounts for the placement of clean backfill into excavated areas for the alternatives including this type of remediation. Therefore, an average concentration of 200 mg/kg is provided as the residential cleanup standard in **Table 2**.

2.7.5 Basis for Taking Action

This ROD for three Picatinny sites presents the RA selected for the sites. The RA is selected in accordance with CERCLA, as amended by the SARA, and the NCP. The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. The information supporting the decisions on the selected RA is contained in the administrative record file for the site. These decisions have been made by the Army and USEPA. Comments received from the NJDEP were evaluated and considered in selecting the final RA, as well. NJDEP concurs with the selected RA, and a copy of the NJDEP concurrence letter for the PP, dated 12 November 2014, is included in Appendix F. A copy of the NJDEP concurrence letter for this ROD, dated 25 August 2017, is also included in Appendix F.

2.8 REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are based on human health and environmental factors, which are considered in the formulation and development of RAs. Such objectives are developed based on the criteria outlined in Section 300.430(e)(2) of the NCP and Section 121 of CERCLA.

The RAOs for the sites included in this ROD are:

- Address soil with contaminants driving the risk or HI for the site greater than 1E-4 to 1E-6 or 1, respectively; and

- Eliminate exposure to soil contaminants to the extent required to reduce the exposure point concentrations below the contaminants respective NJDEP NRDCSRS regardless of whether the contaminant has been designated a risk driver. Although significant risks to ecological receptors were not indicated during the previous ERAs, this RAO would consequently provide additional protection to ecological receptors.

The RAOs have been developed in such a way that attainment of these goals will result in the protection of human health, ecological receptors, and the environment.

2.9 DESCRIPTION OF RESPONSE ACTIONS

This ROD provides a summary of the RAs considered for the Sites and identifies a selected RA. The sites have undergone an RI and an FS in accordance with the CERCLA process. The following paragraphs provide the selected RA based upon the entire body of investigative work.

The types of RAs considered in the FS for the Sites included:

- No action;
- LUCs;
- Containment (soil and asphalt ECs); and
- Removal and off-site disposal.

These measures were then further refined into the four RAs listed below. The RAs are described below with their respective estimated capital costs, estimated cost for operation and maintenance (O&M) activities, and an estimate of the present worth costs for the RA. The selected remedy for all sites is Alternative SL4 – Removal, Off-Site Disposal, and LUCs.

LUCs, ICs, and ECs are discussed below, as they apply to the RAs. LUCs may consist of non-engineered instruments, such as administrative or legal controls, or engineered or physical barriers, such as fences and security guards. LUCs help to minimize the potential for exposure to contamination and/or protect the integrity of a response action and are typically designed to work by limiting land and/or resource use or by providing information that helps modify or guide human behavior at a site. LUCs may be broken down into ICs, the administrative or legal portion of LUCs, or ECs, the engineered or physical barriers. ICs at Picatinny are the administrative measurements put in place to effect human activity, in order to control future land use.

A summary of cost for each RA is presented in **Table 7**. Detailed cost tables for each alternative are provided in **Appendix D**.

2.9.1 Response Action SL-1: No Action

Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $0
Estimated Present Worth Cost: $0

CERCLA and the NCP require that a No Action RA be evaluated at every site to establish a baseline for comparison of other RAs. Under this RA, all administrative controls would cease, no further site monitoring or oversight would be performed, and no remedial action would take place. In order to be eligible for selection, an RA must meet the threshold criteria to adequately eliminate, reduce, and/or control unacceptable risks to human health or the environment. Response Action SL-1 would be an appropriate RA only in the instance that there was no unacceptable risk identified at a site under an unrestricted use scenario.

Site 118/PICA-097
Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $0
Estimated Present Worth Cost: $0

Site 131/PICA-131
Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $0
Estimated Present Worth Cost: $0

Site 149/PICA-149
Estimated Capital Cost: $0
Estimated O&M Cost Over 30 Years: $0
Estimated Present Worth Cost: $0

2.9.2 Response Action SL-2: Soil Cover with Land Use Controls

Estimated Capital Cost: $276,000
Estimated O&M Cost Over 30 Years: $513,000
Estimated Present Worth Cost: $488,000

Under Alternative SL-2, surface soil at Sites 118, 131, and 149 would be addressed by implementation of a clean soil cover, as discussed below. Under this RA, the cover would be considered as an EC. This would remove the exposure pathway for areas that exceed ARARs and eliminate unacceptable human health risks and hazards for the current and reasonably anticipated future use (military/industrial). Although significant risks to ecological receptors were not indicated during the previous ERAs, this RA would consequently provide additional protection/reduction of risks to ecological receptors.

The soil cover would consist of a soil layer of 12 inches overlain by 6 inches of topsoil that would be seeded to establish vegetation. Soil tests, such as geotechnical, agronomic, chemical, and compaction testing, would be conducted to verify the soil materials and placement specifications. Prior to initiation of remedial activities, site clearing and grubbing would take place. Erosion and sediment controls, such as silt fence, would be installed along the downgradient side of the area of disturbance to minimize sediment transport. ECs would be used to reduce fugitive dust emissions throughout construction. The site would be surveyed during cover construction to obtain coordinates of the cover extent, for the definition and maintenance of ECs. It is assumed that construction activities would be conducted in Level D personal protective equipment (PPE) with on-site munitions and explosives of concern (MEC) construction support.

Long-term monitoring and maintenance of the cover areas would be conducted and would include performing and documenting inspections and maintenance of the cover to ensure the integrity and effectiveness of the cover. Maintenance would include mowing and erosional/subsidence repairs, as necessary.

The LUC objectives for the 3 Site Group soils are to ensure that the land use remains as industrial, prohibiting residential buildings, schools, childcare facilities and playgrounds, and to ensure that the soil covers are maintained and not disturbed in the future so that any contact with soil by users would not result in unacceptable risk. LUCs will be maintained until the concentration of hazardous substances in the soil are at levels which would allow for UU/UE.

Existing Army controls are in place, as described in Section 2.2.1, which would aid in the Army's ability to implement, maintain and monitor these LUCs.

Annual Inspections would be performed to confirm existing land use and establish that all ECs are in good condition. The inspections would be documented in annual reports and during the 5-year CERCLA reviews.

Site 118/PICA-097
Estimated Capital Cost: $87,000
Estimated O&M Cost Over 30 Years: $168,000
Estimated Present Worth Cost: $157,000

Figure 8 shows the estimated extent of soil cover at Site 118/PICA-097. Based on the physical and chemical distribution of the data, an AA of approximately 2,400 ft^2 would be covered. This area estimate does not include approximately 175 ft^2 of impacted area that is under the cart path. Soils would be compacted and a clean soil cover would be installed to remove exposure pathways for humans at this site. LUCs would be maintained at the site.

Site 131/PICA-131
Estimated Capital Cost: $86,000
Estimated O&M Cost Over 30 Years: $170,000
Estimated Present Worth Cost: $156,000

Figure 9 shows the estimated extent of soil cover at Site 131/PICA-131. Based on the physical and chemical distribution of the data, an AA of approximately 3,400 ft^2 would be covered. Soils would be compacted and a clean soil cover will be installed to remove exposure pathways for humans at this site. LUCs would be maintained at the site.

Site 149/PICA-149
Estimated Capital Cost: $103,000
Estimated O&M Cost Over 30 Years: $175,000
Estimated Present Worth Cost: $175,000

Figure 10 shows the estimated extent of soil cover at Site 149/PICA-149. Based on the physical and chemical distribution of the data, an AA of approximately 1,900 ft^2 would be covered. Soils would be compacted, and a clean soil cover will be installed to remove exposure pathways for humans at this site. LUCs would be maintained at the site.

2.9.3 Response Action SL-3: Asphalt Cover with Land Use Controls

Estimated Capital Cost: $531,000
Estimated O&M Cost Over 30 Years: $820,000
Estimated Present Worth Cost: $870,000

Under Alternative SL-3, surface soil within the AA would be excavated and graded/prepared to a depth that would allow placement of subbase material for an asphalt cover. If, following grading work, any of the surficial soil from within the AA remains as unused in the grading process, the

soil will be disposed of off-site, as described under RA SL-4. The excavation depth would be determined during the remedial design, but is assumed to be 12 inches. The excavation is assumed to be backfilled with 6 inches of crushed 3/4-inch stone overlain by a wearing course of 4 inches, which is the subbase for the asphalt. A layer of 4 inches of asphalt would be placed over the subbase. Materials testing would be conducted to verify the stone and asphalt materials and placement specifications of the design.

Prior to initiation of remedial activities, site clearing and grubbing would take place, and erosion and sediment controls and ECs would be implemented as outlined in RA SL-2. The site would be surveyed during cover construction to obtain coordinates of the cover extent, for the definition and maintenance of ECs. It is assumed that construction activities would be conducted in Level D PPE with on-site MEC construction support.

This cover would remove the exposure pathway for areas that exceed ARARs and eliminate unacceptable human health risks and hazards for the current and reasonably anticipated future use (military/industrial). Although significant risks to ecological receptors were not indicated during the previous ERAs, this RA would consequently provide additional protection/reduction of risks to ecological receptors. Under this RA, the cover would be considered as an EC.

The LUC objectives for the 3 Site Group soils are to ensure that the land use remains as industrial, prohibiting residential buildings, schools, childcare facilities and playgrounds, and to ensure that the asphalt covers are maintained and not disturbed in the future so that any contact with soil by users would not result in unacceptable risk. LUCs will be maintained until the concentration of hazardous substances in the soil are at levels which would allow for UU/UE. Existing Army controls are in place, as described in Section 2.2.1, which would aid in the Army's ability to implement, maintain and monitor these LUCs.

Annual Inspections would be performed to confirm existing land use and establish that all ECs are in good condition. The inspections would be documented in annual reports and during the 5-year CERCLA reviews.

Site 118/PICA-097
Estimated Capital Cost: $174,000
Estimated O&M Cost Over 30 Years: $269,000
Estimated Present Worth Cost: $285,000

Similar to SL-2, the asphalt cover would be installed over the AA as shown in **Figure 8**. Based on the physical and chemical distribution of the data, an AA of approximately 2,550 ft^2 would be covered (including the portions of the AA below the cart path). LUCs would be maintained at the site.

Site 131/PICA-131
Estimated Capital Cost: $198,000
Estimated O&M Cost Over 30 Years: $301,000
Estimated Present Worth Cost: $323,000

Similar to SL-2, the asphalt cover would be installed over the AA as shown in **Figure 9**. Based on the physical and chemical distribution of the data, an AA of approximately 3,400 ft^2 would be covered. LUCs would be maintained at the site.

Site 149/PICA-149
Estimated Capital Cost: $159,000
Estimated O&M Cost Over 30 Years: $250,000
Estimated Present Worth Cost: $262,000

Similar to SL-2, the asphalt cover would be installed over the AA as shown in **Figure 10**. Based on the physical and chemical distribution of the data, an AA of approximately 1,900 ft^2 would be covered. LUCs would be maintained at the site.

2.9.4 Response Action SL-4: Removal, Off-Site Disposal, and Land Use Controls

Estimated Capital Cost: $651,000
Estimated O&M Cost Over 30 Years: $492,000
Estimated Present Worth Cost: $855,000

Under Response Action SL-4, the soils which exceed ARARs or drive unacceptable human health risks and hazards for the current and reasonably anticipated future use (military/industrial) would be removed utilizing conventional earthmoving equipment. Although significant risks to ecological receptors were not indicated during the previous ERAs, this RA would consequently provide additional protection/reduction of risks to ecological receptors.

The excavated soil would be transported offsite to an appropriate landfill permitted to accept the material. Based on the nature of the waste mass, this material may be disposed at a permitted Resource Conservation and Recovery Act Subtitle D (municipal waste) landfill. This has been pre-determined, based on historical sample data. However, if required by the disposal facility, excavated soil will be laboratory analyzed prior to shipment. Excavated materials would be transported by truck to the receiving landfill after pre-acceptance of the material. It is assumed that excavation activities would be conducted in Level D PPE with on-site MEC construction support.

As previously detailed, a COC delineation refinement study was conducted in March 2016 to aid in delineation in the areas of the RA. Following excavation of the areas and depths currently delineated as AAs, confirmatory sampling would be performed, with samples collected from each sidewall and bottom of the planned excavation areas and analyzed for the COCs. The final maximum excavation depth would be determined by cleanup levels and documented by post excavation sampling, but for costing purposes, it has been estimated based upon the historical and 2016 soil sampling results. Estimated excavation depths are shown on **Figure 8** (Site 118), **Figure 9** (Site 131), and **Figure 10** (Site 149). For Site 118, estimated depths of excavation range from 1 to 3 ft. For Site 131, estimated depths of excavation range from 3 to 4 ft. For Site 149, the entire AA depth is estimated to be 3 ft bgs, with the exception of a small area around sample I-149-SB-002, for which the estimated depth is 0-7 ft bgs (if attainable).

Prior to initiation of remedial activities site clearing and grubbing would take place. Initial excavations will be performed to the horizontal and vertical extents shown in **Figures 8, 9, and 10**. Following initial excavation activities, the excavation walls and bottom will be sampled, with samples submitted for laboratory analysis. While awaiting laboratory confirmatory results, the excavations will be kept open. If one or more of the sidewall samples have results in exceedance of SCGs, additional soil will be excavated in the direction of the exceedance and confirmatory samples collected until either the results are below SCGs or the excavation cannot continue due to an impediment (i.e. building, utilities, etc.).

If average soil concentrations remain above SCGs at the excavation floor, the resulting backfill would be maintained as a soil cover (an EC). Excavations would be backfilled with clean soil (certified), compacted and vegetated as necessary to stabilize the site. A topsoil layer of 6 inches in thickness would be applied to the excavated, backfilled, and regraded area, and the area would be seeded to re-establish vegetative cover.

The LUC objectives for the 3 Site Group soils are to ensure that the land use remains industrial, prohibiting residential buildings, schools, childcare facilities and playgrounds, and protecting users from unacceptable risks posed by contact with soil. Additionally, if after a reasonable effort, soils remain in place which exceed cleanup goals, additional LUCs (as described for Alternative SL-2), would be incorporated into this alternative, and the objective to ensure that the soil covers are maintained and not disturbed in the future would be included. Site conditions such as utilities, building foundations, large boulders or outcrops, or groundwater that cause undue difficulties in accessing subsurface contamination might be considered, after a reasonable effort to access such contamination. LUCs will be maintained until the concentration of hazardous substances in the soil are at levels that would allow for UU/UE. Existing Army controls are in place, as described in Section 2.2.1, which will aid in the Army's ability to implement, maintain and monitor these LUCs.

Five-year reviews will be conducted in compliance with CERCLA and the NCP to ensure that the Selected RA is, and will be, protective of human health and the environment.

Site 118/PICA-097
Estimated Capital Cost: $203,000
Estimated O&M Cost Over 30 Years: $164,000
Estimated Present Worth Cost: $271,000

The excavation would be conducted over an AA of approximately 2,550 ft^2 shown in **Figure 8**. Four different areas of excavation have been defined within Site 118, 196 ft^2 and 225 ft^2 areas both to a depth of 1.0 ft bgs, and 2,048 ft^2 and 74 ft^2 areas both to a depth of 3 ft bgs. The final extent and depth of excavation will be determined based upon confirmatory sampling, although depths are not expected to extend below 3 ft bgs. LUCs restricting residential use would be maintained at the site.

Site 131/PICA-131
Estimated Capital Cost: $256,000
Estimated O&M Cost Over 30 Years: $164,000
Estimated Present Worth Cost: $324,000

The excavation will be conducted over an AA of approximately 3,400 ft^2 shown in **Figure 9**. Four different areas of excavation have been defined within Site 131, 1,260 ft^2, 1,625 ft^2, and 225 ft^2 areas all to a depth of 3 ft bgs, and a 270 ft^2 area to a depth of 4 ft bgs. The final extent and depth of excavation will be determined based upon confirmatory sampling, although depths are not expected to extend below 4 ft bgs. LUCs restricting residential use would be maintained at the site.

Site 149/PICA-149
Estimated Capital Cost: $192,000
Estimated O&M Cost Over 30 Years: $164,000
Estimated Present Worth Cost: $260,000

The excavation will be conducted over an AA of approximately 1,900 ft^2 shown in **Figure 10**. Five different areas of excavation have been defined within Site 149, 934 ft^2, 427 ft^2, 234 ft^2 and 225 ft^2 areas all to a depth of 3 ft bgs, and a 63 ft^2 area to a depth of 7 ft bgs (if possible). The final extent and depth of excavation will be determined based upon confirmatory sampling, although depths are not expected to extend below 3 ft bgs (except in the sample I-149-SB-002 area). LUCs restricting residential use would be maintained at the site.

2.10 COMPARATIVE ANALYSIS OF RESPONSE ACTIONS

This section summarizes the comparative analysis of the expected performance of each RA relative to the other alternatives to identify their respective advantages and disadvantages in selecting a remedy. The advantages and disadvantages of each of the RAs were compared using the nine CERCLA evaluation criteria under Sections 121(a) and 121(b) in NCP Section 300.430(e)(9)(iii) of the NCP. The nine CERCLA evaluation criteria are divided into threshold criteria, primary balancing criteria, and modifying criteria. A comparative analysis of the alternatives is addressed within this section. An overview of the comparative analysis of threshold and balancing criteria is provided in **Table 8**.

2.10.1 Threshold Criteria

These are standards that an alternative must meet to be eligible for selection as a remedial action. There is little flexibility in meeting the threshold criteria - the alternative must meet the criteria or it is unacceptable.

1. Overall protection of human health and the environment
2. Compliance with ARARs

2.10.1.1 Protection of Human Health and the Environment

All alternatives except for Alternative SL-1 are protective of human health and the environment in the short term and long term. Alternatives SL-2, SL-3, and SL-4 remove the exposure pathway of the contaminated soils driving an unacceptable risk for the current site use. LUCs would be used to maintain and protect the capped areas in the future.

None of the subject sites are located within designated wetland areas. In particular, Site 149, which is located near Picatinny Lake is not located within a wetland specified by the National Wetland Inventory or in the 100-year floodplain specified by the Federal Emergency Management Agency. Picatinny Lake is a Category Two surface water body, per New Jersey Surface Water Quality regulations, and therefore does not have a designated buffer zone which might impact work.

2.10.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Alternative SL-1 does not achieve ARARs. Alternatives SL-2, SL-3, and SL-4 will meet chemical-specific ARARs by interrupting the exposure pathway to contaminants remaining on site or removing the soils. Location-specific and action-specific ARARs will be met by Alternatives SL-2, SL-3, and SL-4.

2.10.2 Primary Balancing Criteria

These criteria weigh the tradeoffs between alternatives and represent the standards upon which the detailed evaluation and comparative analysis of alternatives are based. In general, a high rating on one criterion can offset a low rating on another balancing criterion.

2.10.2.1 Long-term Effectiveness and Permanence

Alternatives SL-2, SL-3, and SL-4 are effective in reducing risk to human health because they remove the pathway of exposure over the long term. Of these three alternatives, Alternative SL-4 will be most effective in the long term, as it removes contaminant concentrations from the site to a depth of at least 2 ft, and any concentrations remaining below that are protected by the 2 ft or more of fill placed after the excavation.

For Alternatives SL-2 and SL-3, the cover would be installed in inactive areas at Site 149 which currently have vegetative ground cover. Unstressed asphalt deteriorates faster than stressed asphalt, so the long-term effectiveness of Alternative SL-3 would be reduced compared to a soil cover at this location. However, Alternatives SL-2, SL-3, and SL-4 are each expected to provide a reliable means of meeting RAOs in the long term.

2.10.2.2 Reduction in Toxicity, Mobility, or Volume through Treatment

Alternative SL-1 does not contribute to the reduction in the toxicity, mobility, or volume of wastes present at the site. Although none of the remaining alternatives involve treatment of the impacted soil, Alternatives SL-2 and SL-3 reduce the mobility of wastes present at the site, and

Alternative SL-4 reduces the volume of waste at the site by excavation and off-site disposal; however, the waste volume is transferred from the site to the disposal facility.

2.10.2.3 Short-term Effectiveness

Alternatives SL-2, SL-3, and SL-4 have minor short-term effectiveness issues due to the active nature of the alternative compared to Alternative SL-1. Workers involved in implementation of Alternatives SL-2, SL-3, and SL-4 will utilize protective equipment and clothing and ECs to prevent exposure to potential site risks.

2.10.2.4 Implementability

The most readily implementable alternative is Alternative SL-1. Alternatives SL-2, SL-3, and SL-4 may require site clearing, particularly at Site 149, which may only be performed during the winter in order to avoid disturbing the Indiana Bat.

2.10.2.5 Cost

Alternative SL-3 is the most costly RA considered, followed by SL-4 and SL-2, respectively. There is no cost associated with Alternative SL-1. Detailed cost tables for each RA alternative are provided in **Appendix D**.

2.10.3 Modifying Criteria

These are criteria considered to the extent that information is available during the FS, but can be fully considered only after public and regulator comments.

2.10.3.1 State/Agency Acceptance

This document was prepared in partnership with USEPA and NJDEP representatives. The USEPA and NJDEP have expressed their support for RA SL-4.

2.10.3.2 Community Acceptance

During the public comment period, the community generally expressed its support for RA SL-4.

2.11 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that USEPA will use treatment to address the principal threats posed by a site wherever practicable [NCP 300.430(a)(1)(iii)(A)]. Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and would present only a low risk in the event of exposure. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied. As concluded

in the Risk Assessments, none of the contaminants that exceeded LOCs in soil at these sites meet the criteria of principal threat waste.

2.12 SELECTED RESPONSE ACTION

As a result of the comparative analysis, the Army selects RA SL-4: Removal, Off-Site Disposal, and LUCs for Sites 118, 131 and 149 at Picatinny. This RA was developed in accordance with CERCLA as amended and consistent with the NCP and includes the following components:

- Removal and off-site disposal; and
- Land Use Controls.

2.12.1 Summary of the Rationale for the Selected Response Action

The selected RA achieves the RAOs, meets the threshold criteria, and provides the best balance of tradeoffs with respect to the balancing and modifying criteria. This alternative is implementable, the most effective in meeting the RAOs, and is cost effective. A detailed description of the selected remedy will be provided in the Remedial Design.

An LUC Remedial Design will be prepared as the land use component of the Remedial Design. Within 90 days of ROD signature, the Army shall prepare and submit to USEPA for a review and approval an LUC Remedial Design that shall contain implementation and maintenance actions, including periodic inspections.

2.12.2 Summary of Estimated Response Action Costs

The costs associated with the excavation and disposal of contaminated soils and implementing and maintaining LUCs for soils at Sites 118, 131, and 149 are provided in detailed cost tables provided in **Appendix D**, and the totals are summarized below:

Estimated Capital Cost: $651,000
Estimated O&M Cost Over 30 Years: $492,000
Estimated Present Worth Cost: $855,000

2.12.3 Expected Outcomes of the Selected Response Action

It is anticipated that current land use will continue unchanged after implementation of the selected RA. It is expected that enforcement of LUCs will ensure risks to human and ecological receptors remain within acceptable levels.

2.13 STATUTORY DETERMINATIONS

Under CERCLA § 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, and comply with ARARs (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and RA treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA

includes a preference for remedies that employ treatment and permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as a principal element and are biased against off-site disposal of untreated wastes. The following sections discuss how the Selected Response Action meets these statutory requirements.

2.13.1 Protection of Human Health and the Environment

The selected RA will protect human health and the environment by removing existing on-site contamination and the use of LUCs that limit exposure for the current and reasonably anticipated land use (military/industrial).

2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected RA is expected to comply with chemical-specific ARARs for soil by interrupting the exposure pathway to contaminants remaining on-site or removing the contaminated soils. Laws/regulations and associated chemical-specific requirements are listed in **Table 4**. Specific SCGs were selected for soil in the Sites 118, 131, and 149 Final FS (ARCADIS, 2014a) based primarily on the New Jersey soil cleanup criteria which were in effect at the time. The SCGs are presented in **Table 2**.

Remedial action alternatives may be restricted or precluded by federal, state, and U.S. Army regulations based on their location within a site. Location-specific ARARs are general restrictions that may be placed on the types of activities that may occur in particular locations. Location-specific ARARs generally prevent damage to unique or sensitive areas, such as flood plains, historic places, wetlands, and fragile ecosystems, and restrict other activities that are potentially harmful because of where they take place.

Table 5 identifies the federal, state, and U.S. Army regulations that contain promulgated standards, requirements, criteria, or limitations that will be considered ARARs. The selected RA, SL-4, will comply with the location-specific ARARs identified.

Action-specific ARARs are promulgated state or federal laws that are usually technology- or activity-based requirements or limitations placed on actions taken with respect to cleanup actions, or requirements to conduct certain actions to address particular circumstances at a site. Set performance, design, or other similar operational controls or restrictions on particular activities related to management of hazardous substances or pollutants. These requirements address specific activities that are used to accomplish a remedy. Action-specific ARARs do not, in and of themselves, determine the remedial action; rather, they define how a selected remedial action alternative must be designed, operated, or managed.

TBCs are non-promulgated policies, criteria, advisories, guidance, and proposed standards developed by Federal and State environmental and public health agencies that are not legally enforceable but contain helpful information and are collectively referred to as TBC criteria. They can be helpful in carrying out selected remedies or in determining the level of protectiveness of selected remedies. The TBCs are meant to complement the use of ARARs, not compete with or replace them.

The action-specific ARARs and TBC levels are organized by the associated actions and presented in **Table 6**. The selected RA, SL-4, will comply with the action-specific ARARs identified.

2.13.3 Cost Effectiveness

In the lead agency's judgment, the selected RA is cost-effective and represents a reasonable value in the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" (NCP §300.430(f)(1)(ii)(D)). This determination was accomplished by evaluating the "overall effectiveness" of those RAs that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing the five balancing criteria in combination (long-term effectiveness and permanence, reduction in toxicity, mobility and volume through treatment, short-term effectiveness, implementability, and costs). A comparison of the costs to the overall effectiveness was conducted to determine cost effectiveness. The relationship of the overall effectiveness of the selected RA was determined to be proportional to its costs, and hence the selected RA represents a reasonable value for the money to be spent.

The Army believes that the selected RA is cost-effective and is protective of human health and the environment.

2.13.4 Utilization of Permanent Solutions and Response Action Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Possible

The selected RA employs permanent solutions to reduce the total volume of contaminants present at the site. The selected RA satisfies the criteria for long-term effectiveness by preventing unacceptable exposures to site soils. Although the soil is not treated, the selected RA reduces the toxicity, mobility and volume of contamination at the site. Additionally, there are no significant implementability issues associated with the selected RA.

2.13.5 Preference for Treatment as a Principal Element

The selected RA does not address remediation through the use of active treatment technologies. The selected RA was chosen over alternative RAs after considering the balancing criteria such as implementability, cost, and community acceptance.

2.13.6 Five-Year Review Requirements

This RA will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for UU/UE. Therefore, statutory reviews will be conducted every five years after RA initiation. Five-year reviews will ensure that the Selected RA is, or will be, protective of human health and the environment.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES FROM SELECTED RESPONSE ACTION FROM PROPOSED PLAN

The selected RA in this ROD was presented as the preferred RA within the Sites 118, 131, and 149 PP. No significant changes have been made. Additional data are presented within this ROD resulting from the COC Delineation Refinement Study performed in March 2016.

3.0 PART 3: RESPONSIVENESS SUMMARY

The final component of this ROD is the Responsiveness Summary. The purpose of the Responsiveness Summary is to provide a summary of the stakeholders' comments, concerns, and questions about the selected RA for the three Picatinny sites and the Army's responses to these concerns.

The Army has fulfilled the public participation requirements identified in 40 CFR 300.430(f), and Title 10 United States Code 2705(b)(2), and maintained an administrative record, which is available for the public, in accordance with 40 CFR 300.800. The three Picatinny sites have been the topic of presentations at the PAERAB. A copy of the PP was given to the PAERAB's co-chair and a copy was offered to all PAERAB members. A final PP for the three Picatinny sites was completed and released to the public on August 28, 2014 at the information repositories listed in Section 2.3.

Multiple newspaper notifications were made to inform the public of the start of the PP comment period, solicit comments from the public, and announce the public meeting. The notification was run in the Daily Record on August 28, 2014 and in the Star Ledger on September 3, 2014. Copies of the certificates of publication are provided in **Appendix A**. A public meeting was held on September 11, 2014 to inform the public about the selected RA for the three Picatinny sites and to seek public comments. At this meeting, representatives from the US Army, NJDEP, USEPA, and the Army's contractor, ARCADIS, were present to answer questions about the sites and RAs under consideration. A public comment period was held from September 11, 2014 to October 11, 2014, during which verbal comments from NJDEP and the public were received and one written comment from the public was received.

All comments and concerns summarized below have been considered by the Army and USEPA in selecting the final cleanup methods for the Site.

3.1 PUBLIC ISSUES AND LEAD AGENCY RESPONSES

As of the date of this ROD, the Army, USEPA, and NJDEP endorse the selected RA for the three sites included in this ROD. Comments received during the public comment period on the PP are summarized below. The comments are categorized by source.

3.1.1 Summary of Written Comments Received during the Public Comment Period

Comment No. 1, Michael Glaab, Restoration Advisory Board Community Member (Letter to Mr. Ted Gabel dated October 9, 2014). *(NOTE: Due to the length of this letter, only excerpts of the letter directly relevant to this ROD and requiring responses are presented in this section. The letter is presented in its entirety in* ***Appendix E****).*

Is asbestos currently present onsite? Presumably asbestos was excluded from Table 2 of the PP because of its relatively minimal presence at Site 131/PICA-131. But even if the presence of asbestos is relatively minimal that does not necessarily justify excluding it from the table. Why was asbestos excluded? If asbestos currently exists onsite is a removal action anticipated?

> ***Response to point #1**: Based on the historical information related to the Site 131 building, it is possible that asbestos-containing materials are present in the Site 131 building, but no building demolition is planned at this site. In most cases, removal of asbestos-containing building materials is regulated through Section 112 of the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) and not through CERCLA. All asbestos-related work at Picatinny Arsenal is conducted in accordance with the Installation Asbestos Management Plan.*

Why was beryllium excluded? Even if the presence of beryllium is relatively minimal that does not necessarily justify excluding mention of its presence in the table. Is a removal action of beryllium anticipated?

> ***Response to point #2**: As noted in the PP, while there were elevated concentrations of beryllium noted in the Phase II Ecological Risk Assessment, the toxicity bioassay and environmental effects quotients study deemed that there is minimal risk to the populations of terrestrial receptors. Additionally, there were no soil samples that contained beryllium at concentrations in excess of the LOCs. Therefore, beryllium was not included as a contaminant of concern in Table 2. As noted in the ROD, however, the NRCDSRS are ARARs, with the exception of inhalation-based numbers such as manganese, and the excavations will need to remove constituents to achieve the ARARs. The removal of beryllium is not anticipated.*

Are uranium isotopes and/or its radioactive decay byproducts present onsite? Have all of the radioactive decay products of that Uranium, if any, been adequately disposed of? This potential issue is problematic since it is related to other factors such as the use of the hazardous waste pressurized incinerator situated at the arsenal. Additional information regarding this topic is requested – specifically whether or not the above referred to incinerator will be used to dispose of radioactive substances. Care should be taken to assure that sufficient excavation will occur to result in achieving conformity with responsible and safe standards for Uranium and/or its isotopes.

> ***Response to point #3**: As noted in the Site 131 background section, "uranium-containing valves and gauges," which are primarily self-contained, have been and may still be used in wind tunnel operations. There have been no documented releases of uranium at this site and any radiological equipment is properly stored or disposed when no longer used. Uranium has not been identified as a contaminant of concern for any of the sites in this ROD and excavations will, therefore, be conducted to achieve noted ARARs (NRDCSRS). There are no radiological wastes of which to dispose from any of the sites in this ROD. Soil excavated from these sites will be disposed at an appropriate facility. Questions referring to the incinerator are unrelated to Site 131 and the CERCLA program. Further questions on this matter should be directed to Picatinny Environmental Affairs Division.*

It would be more reassuring had additional water and sediment samples been taken and analyzed.

> ***Response to point #4**: Groundwater at Site 131 is addressed through the Mid-Valley Groundwater ROD (US Army, 2012). Groundwater at Site 118 is addressed through the Area D Groundwater ROD (US Army, 2004a). Both of these RODs included active remedies and ongoing monitoring efforts to protect groundwater at Picatinny. Groundwater at Site 149 did not have any LOC exceedances, so additional monitoring is not warranted. Sediment and surface water at Site 118 are addressed through the Green Pond Brook/Bear Swamp Brook ROD (US Army, 2004b). This ROD includes monitoring activities at various sites to ensure protection of the sediment and water of these water bodies. Site 149 is adjacent to Picatinny Lake and Picatinny Lake surface water and sediments are being addressed under a separate FS (ARCADIS, 2014b).*

Accordingly, I request additional clarification. Prudence requires that sufficient excavation occur to achieve conformity to responsible and safe standards for Manganese.

> ***Response to point #5**: The cleanup goal established for manganese at these sites is noted in the PP and this ROD as the USEPA Industrial Regional Screening Level (IRSL). Ms. Anne Pavelka (NJDEP Case Manager of the Bureau of Case Management) stated that the NJDEP plans to revise their NRDCSRS for manganese in the near future and stated that the USEPA IRSL for manganese would be an acceptable cleanup goal to the NJDEP.*

Therefore, it is to be expected that care will be taken to assure that sufficient excavation will occur at this site to result in its conformity to the state standards for Thallium – as well as for the other contaminants. Prudence requires that sufficient excavation occur to achieve conformity to responsible and safe standards for Thallium.

> ***Response to point #6**: As noted in this ROD, pre-design sampling and post-excavation sampling will be conducted to ensure that the cleanup goals and ARARs are achieved for these sites.*

Excavate sufficiently to assure conformity to the state standards for all onsite contaminants.

> ***Response to point #7**: As noted in this ROD, pre-design sampling and post-excavation sampling will be conducted to ensure that the cleanup goals and ARARs are achieved for these sites.*

However, it should be noted that a not inconsiderable amount of <u>individuals actually reside on the premises of the arsenal</u>, among them are the families of diverse military personnel and contractors. More residents may be expected to assume residence at the arsenal. Therefore, prudence dictates that where there is a likelihood that individuals will reside for extended time intervals greater than those typically expected for onsite workers, that sufficient excavation occur to achieve conformity to responsible and safe residential standards. In addition, the excavated materials must be safely transported from the arsenal to a properly accredited and maintained facility elsewhere that is designed to safely accommodate the contaminants.

> ***Response to point #8**: It is noted that there are areas of Picatinny that do allow residences; however, these sites are not areas at which residential use is considered a*

reasonably anticipated future land use. Therefore, the excavation areas will be appropriately defined by achieving the non-residential cleanup goals set forth in the PP and this ROD. All excavated materials will be properly handled, transported, and disposed from Picatinny at an appropriate disposal facility.

Comment No. 2, Mark Hiler, Restoration Advisory Board Community Member (Comment Form). I am encouraged with the cooperation between EPA, NJDEP, and Army with level of cleanup at these Sites.

Response to Comment No. 2*: Noted.*

3.1.2 Summary of Comments Received During the Public Meeting on the Proposed Plan and Agency Responses

Comment No. 1, Mark Hiler, Restoration Advisory Board Community Member.

It's great to see the Army cleaning up to New Jersey standards. How much does it cost to get these three sites to this point?

Response to Comment No. 1*: The three sites included in the PP and this ROD were components of larger groups of sites that were investigated at different times under different task orders. In addition, there are other sites in other groups that are on parallel paths with these three sites (under the same lump sum task order), and efforts associated with some of those sites have contributed to these three sites getting to this point in the CERCLA process. Therefore, it is incredibly difficult to identify a single cost associated solely with these three sites given how interwoven these sites are with other site documents/progress and the time over which these large groups of sites have been within the CERCLA process.*

Comment No. 2, Michael Glaab, Restoration Advisory Board Community Member.

As you are excavating, you'll be taking samples and examining and, depending on the analysis, there may have to be doing more excavating, which may affect the price. So, you cannot speak with 100 percent certainty about the costs.

Response to Comment No. 2*: Correct. The Army will collect pre-design samples and post-excavation samples to help determine the extent of the excavation, which could change the size of the excavation and directly impact the cost. The costs that are estimated and presented in the PP and this ROD are calculated using engineering assumptions and judgments based on information that is available for each of the sites and standard engineering procedures.*

Comment No. 3, Anne Pavelka, NJDEP Case Manager of the Bureau of Case Management

The NJDEP is very pleased the Army is proposing an action using our soil remediation standards. I also want to mention with respect to manganese that currently our standards are

being revised higher, and I was told 23,000 [mg/kg] would be an acceptable number for this remedial action. We fully support the Proposed Plan.

Response to Comment No. 3. *The NJDEP's comments are noted and appreciated.*

3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues were raised on the selected RA.

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US Army, 2014. *Proposed Plan PICA-097, -131, and -149 (Sites 118, 131, and 149),* US Army Garrison, Picatinny Arsenal, New Jersey. April.

Figures

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LIST OF FIGURES

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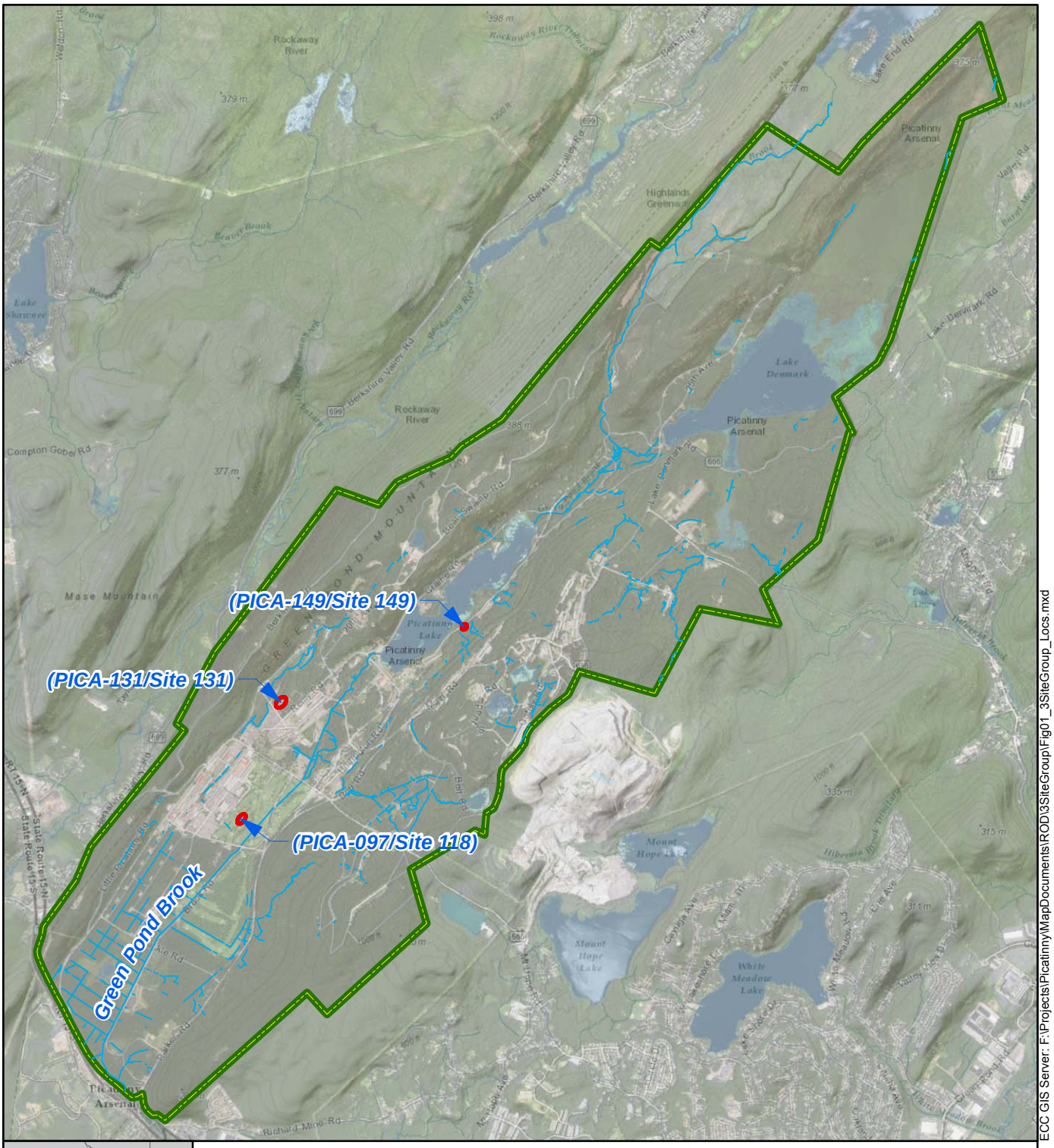

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 1
Location of Picatinny Arsenal

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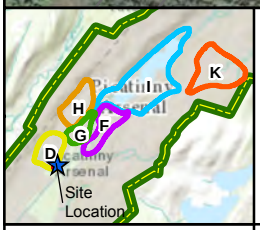


Legend

- PICA Site 118/PICA-097
- Installation Boundary
- Former or Existing Building
- Road

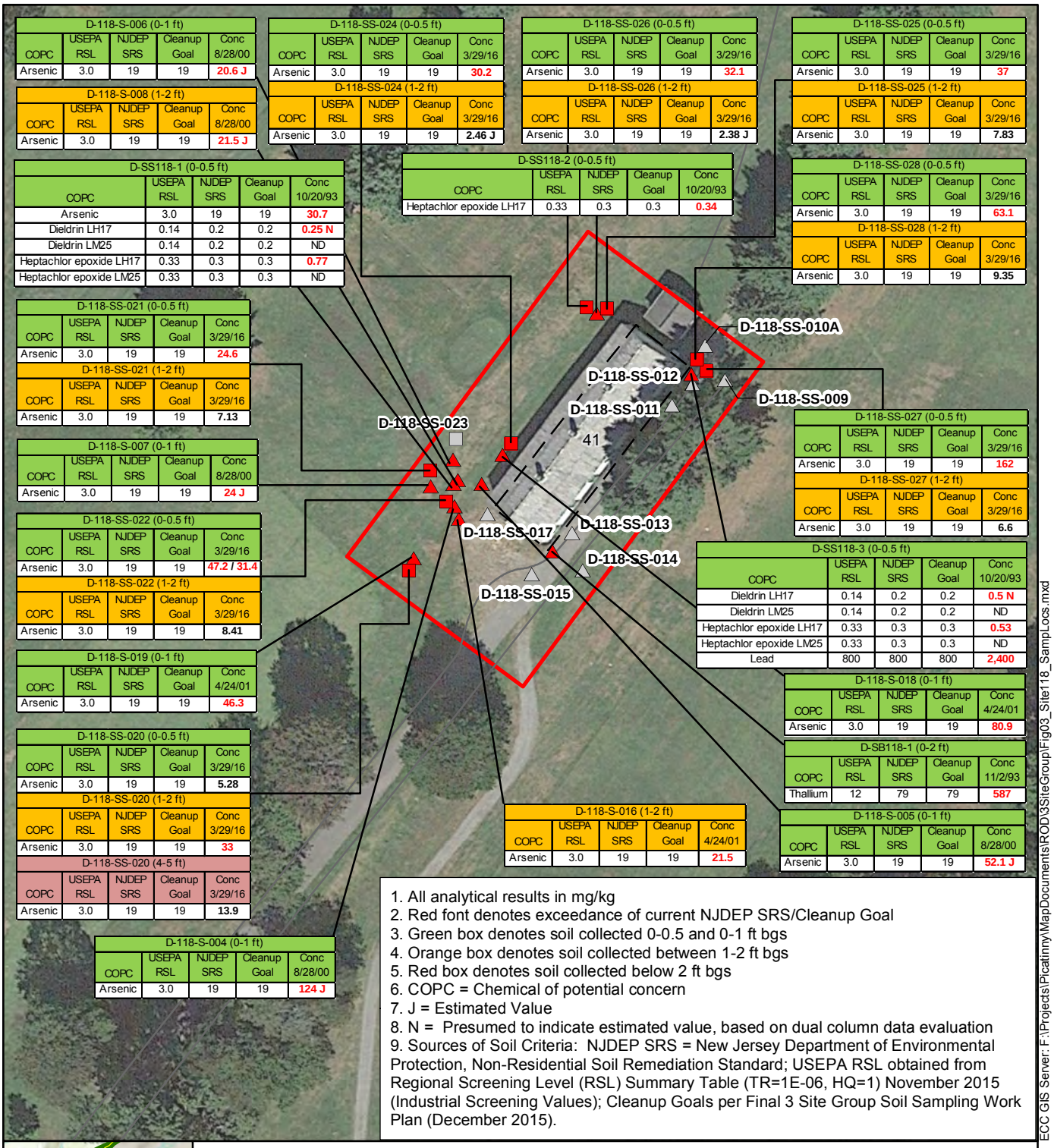
N
W E
S

Feet
0 15 30 60

ECC GIS Server: F:\Projects\Picatinny\MapDocuments\ROD\3SiteGroup\Fig02_Site118.mxd

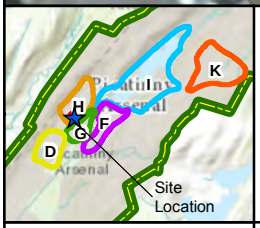
PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 2
Layout of Site 118/PICA-097
Building 41



PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 3
Soil Sample Exceedances of Cleanup Goals at Site 118/PICA-097



Legend

- PICA Site 131/PICA-131
- Installation Boundary
- Former or Existing Buildings
- Road

N
W E
S

Feet
0 15 30 60

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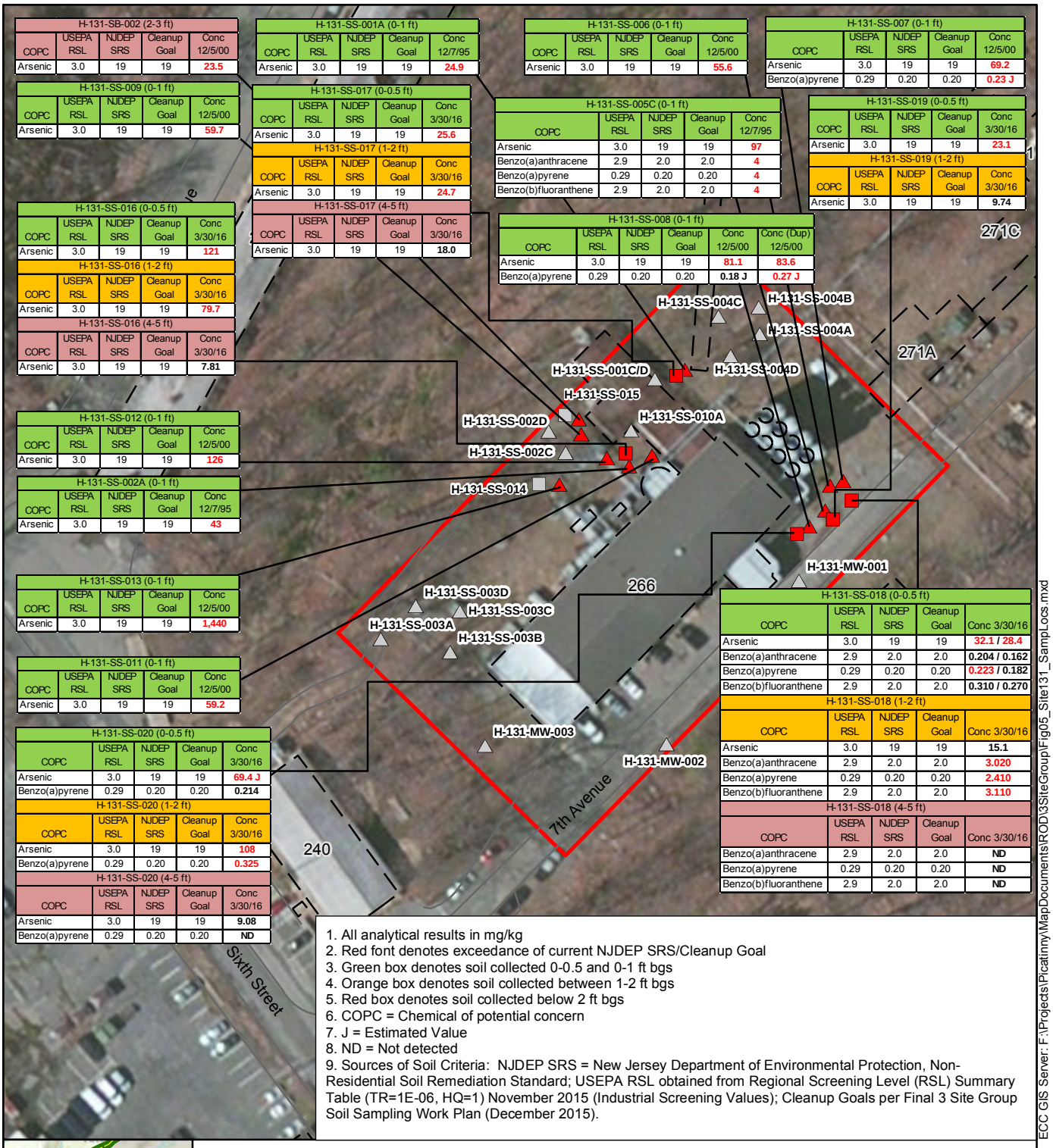
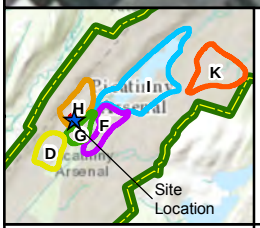
PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 4
Layout of Site 131/PICA-131
Building 266



1. All analytical results in mg/kg
2. Red font denotes exceedance of current NJDEP SRS/Cleanup Goal
3. Green box denotes soil collected 0-0.5 and 0-1 ft bgs
4. Orange box denotes soil collected between 1-2 ft bgs
5. Red box denotes soil collected below 2 ft bgs
6. COPC = Chemical of potential concern
7. J = Estimated Value
8. ND = Not detected
9. Sources of Soil Criteria: NJDEP SRS = New Jersey Department of Environmental Protection, Non-Residential Soil Remediation Standard; USEPA RSL obtained from Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) November 2015 (Industrial Screening Values); Cleanup Goals per Final 3 Site Group Soil Sampling Work Plan (December 2015).



Legend

- Installation Boundary
- PICA Site 131/PICA-131
- Former or Existing Building
- Road

Sample Locations in March 2016

- Soil Sample where COPC concentration Exceeds Cleanup Goal
- Soil Sample where COPC concentrations Less Than Cleanup Goal

Previous Sample Locations

- Soil Sample where COPC concentration Exceeds Cleanup Goal
- Soil Sample where COPC concentrations Less Than Cleanup Goal

N W E S

Feet

0 20 40 80

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 5
Soil Sample Exceedances of Cleanup Goals at Site 131/PICA-131

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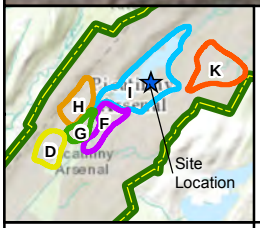


Legend

- PICA Site 149/PICA-149
- Installation Boundary
- Former or Existing Buildings
- Water Bodies
- Road

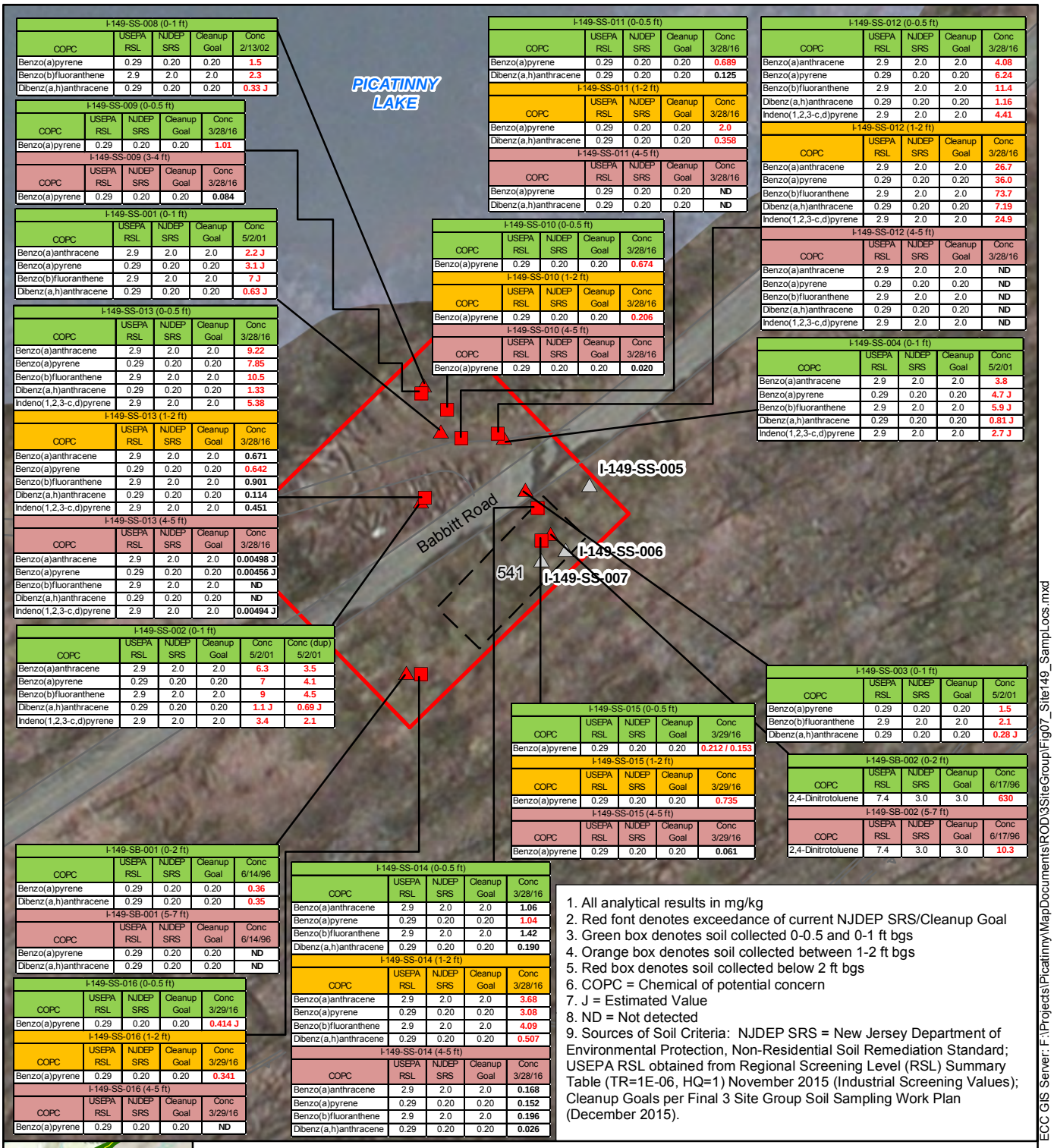
N
W E
S

Feet
0 15 30 60

ECC GIS Server: F:\Projects\Picatinny\MapDocuments\ROD\3SiteGroup\Fig06_Site149.mxd

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 6
Layout of Site 149/PICA-149
Propellant Plant



I-149-SS-008 (0-1 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 2/13/02
Benzo(a)pyrene	0.29	0.20	0.20	1.5
Benzo(b)fluoranthene	2.9	2.0	2.0	2.3
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.33 J

I-149-SS-009 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	1.01

I-149-SS-009 (3-4 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	0.084

I-149-SS-001 (0-1 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 5/2/01
Benzo(a)anthracene	2.9	2.0	2.0	2.2 J
Benzo(a)pyrene	0.29	0.20	0.20	3.1 J
Benzo(b)fluoranthene	2.9	2.0	2.0	7 J
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.63 J

I-149-SS-013 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	9.22
Benzo(a)pyrene	0.29	0.20	0.20	7.85
Benzo(b)fluoranthene	2.9	2.0	2.0	10.5
Dibenz(a,h)anthracene	0.29	0.20	0.20	1.33
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	5.38

I-149-SS-013 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	0.671
Benzo(a)pyrene	0.29	0.20	0.20	0.642
Benzo(b)fluoranthene	2.9	2.0	2.0	0.901
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.114
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	0.451

I-149-SS-013 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	0.00498 J
Benzo(a)pyrene	0.29	0.20	0.20	0.00456 J
Benzo(b)fluoranthene	2.9	2.0	2.0	ND
Dibenz(a,h)anthracene	0.29	0.20	0.20	ND
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	0.00494 J

I-149-SS-002 (0-1 ft)					
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 5/2/01	Conc (dup) 5/2/01
Benzo(a)anthracene	2.9	2.0	2.0	6.3	3.5
Benzo(a)pyrene	0.29	0.20	0.20	7	4.1
Benzo(b)fluoranthene	2.9	2.0	2.0	9	4.5
Dibenz(a,h)anthracene	0.29	0.20	0.20	1.1 J	0.69 J
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	3.4	2.1

I-149-SB-001 (0-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 6/14/96
Benzo(a)pyrene	0.29	0.20	0.20	0.36
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.35

I-149-SB-001 (5-7 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 6/14/96
Benzo(a)pyrene	0.29	0.20	0.20	ND
Dibenz(a,h)anthracene	0.29	0.20	0.20	ND

I-149-SS-016 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/29/16
Benzo(a)pyrene	0.29	0.20	0.20	0.414 J

I-149-SS-016 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/29/16
Benzo(a)pyrene	0.29	0.20	0.20	0.341

I-149-SS-016 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/29/16
Benzo(a)pyrene	0.29	0.20	0.20	ND

I-149-SS-011 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	0.689
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.125

I-149-SS-011 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	2.0
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.358

I-149-SS-011 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	ND
Dibenz(a,h)anthracene	0.29	0.20	0.20	ND

I-149-SS-010 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	0.674

I-149-SS-010 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	0.206

I-149-SS-010 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)pyrene	0.29	0.20	0.20	0.020

I-149-SS-012 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	4.08
Benzo(a)pyrene	0.29	0.20	0.20	6.24
Benzo(b)fluoranthene	2.9	2.0	2.0	11.4
Dibenz(a,h)anthracene	0.29	0.20	0.20	1.16
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	4.41

I-149-SS-012 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	26.7
Benzo(a)pyrene	0.29	0.20	0.20	36.0
Benzo(b)fluoranthene	2.9	2.0	2.0	73.7
Dibenz(a,h)anthracene	0.29	0.20	0.20	7.19
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	24.9

I-149-SS-012 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	ND
Benzo(a)pyrene	0.29	0.20	0.20	ND
Benzo(b)fluoranthene	2.9	2.0	2.0	ND
Dibenz(a,h)anthracene	0.29	0.20	0.20	ND
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	ND

I-149-SS-004 (0-1 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 5/2/01
Benzo(a)anthracene	2.9	2.0	2.0	3.8
Benzo(a)pyrene	0.29	0.20	0.20	4.7 J
Benzo(b)fluoranthene	2.9	2.0	2.0	5.9 J
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.81 J
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	2.7 J

I-149-SS-015 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/29/16
Benzo(a)pyrene	0.29	0.20	0.20	0.212 / 0.153

I-149-SS-015 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/29/16
Benzo(a)pyrene	0.29	0.20	0.20	0.735

I-149-SS-015 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/29/16
Benzo(a)pyrene	0.29	0.20	0.20	0.061

I-149-SS-014 (0-0.5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	1.06
Benzo(a)pyrene	0.29	0.20	0.20	1.04
Benzo(b)fluoranthene	2.9	2.0	2.0	1.42
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.190

I-149-SS-014 (1-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	3.68
Benzo(a)pyrene	0.29	0.20	0.20	3.08
Benzo(b)fluoranthene	2.9	2.0	2.0	4.09
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.507

I-149-SS-014 (4-5 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 3/28/16
Benzo(a)anthracene	2.9	2.0	2.0	0.168
Benzo(a)pyrene	0.29	0.20	0.20	0.152
Benzo(b)fluoranthene	2.9	2.0	2.0	0.196
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.026

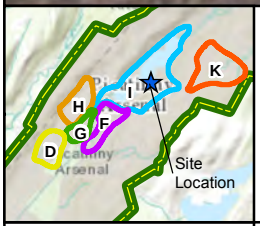
I-149-SS-004 (0-1 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 5/2/01
Benzo(a)anthracene	2.9	2.0	2.0	3.8
Benzo(a)pyrene	0.29	0.20	0.20	4.7 J
Benzo(b)fluoranthene	2.9	2.0	2.0	5.9 J
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.81 J
Indeno(1,2,3-c,d)pyrene	2.9	2.0	2.0	2.7 J

I-149-SS-003 (0-1 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 5/2/01
Benzo(a)pyrene	0.29	0.20	0.20	1.5
Benzo(b)fluoranthene	2.9	2.0	2.0	2.1
Dibenz(a,h)anthracene	0.29	0.20	0.20	0.28 J

I-149-SB-002 (0-2 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 6/17/96
2,4-Dinitrotoluene	7.4	3.0	3.0	630

I-149-SB-002 (5-7 ft)				
COPC	USEPA RSL	NJDEP SRS	Cleanup Goal	Conc 6/17/96
2,4-Dinitrotoluene	7.4	3.0	3.0	10.3

1. All analytical results in mg/kg
2. Red font denotes exceedance of current NJDEP SRS/Cleanup Goal
3. Green box denotes soil collected 0-0.5 and 0-1 ft bgs
4. Orange box denotes soil collected between 1-2 ft bgs
5. Red box denotes soil collected below 2 ft bgs
6. COPC = Chemical of potential concern
7. J = Estimated Value
8. ND = Not detected
9. Sources of Soil Criteria: NJDEP SRS = New Jersey Department of Environmental Protection, Non-Residential Soil Remediation Standard; USEPA RSL obtained from Regional Screening Level (RSL) Summary Table (TR=1E-06, HQ=1) November 2015 (Industrial Screening Values); Cleanup Goals per Final 3 Site Group Soil Sampling Work Plan (December 2015).



Legend

- Installation Boundary
- PICA Site 149/PICA-149
- Former or Existing Buildings
- Water Bodies
- Road

Sample Locations in March 2016

- Soil Sample where COPC concentration Exceeds Cleanup Goal
- Soil Sample where COPC concentrations Less Than Cleanup Goal

Previous Sample Locations

- Soil Sample where COPC concentration Exceeds Cleanup Goal
- Soil Sample where COPC concentrations Less Than Cleanup Goal

N W E S

Feet

0 15 30 60

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

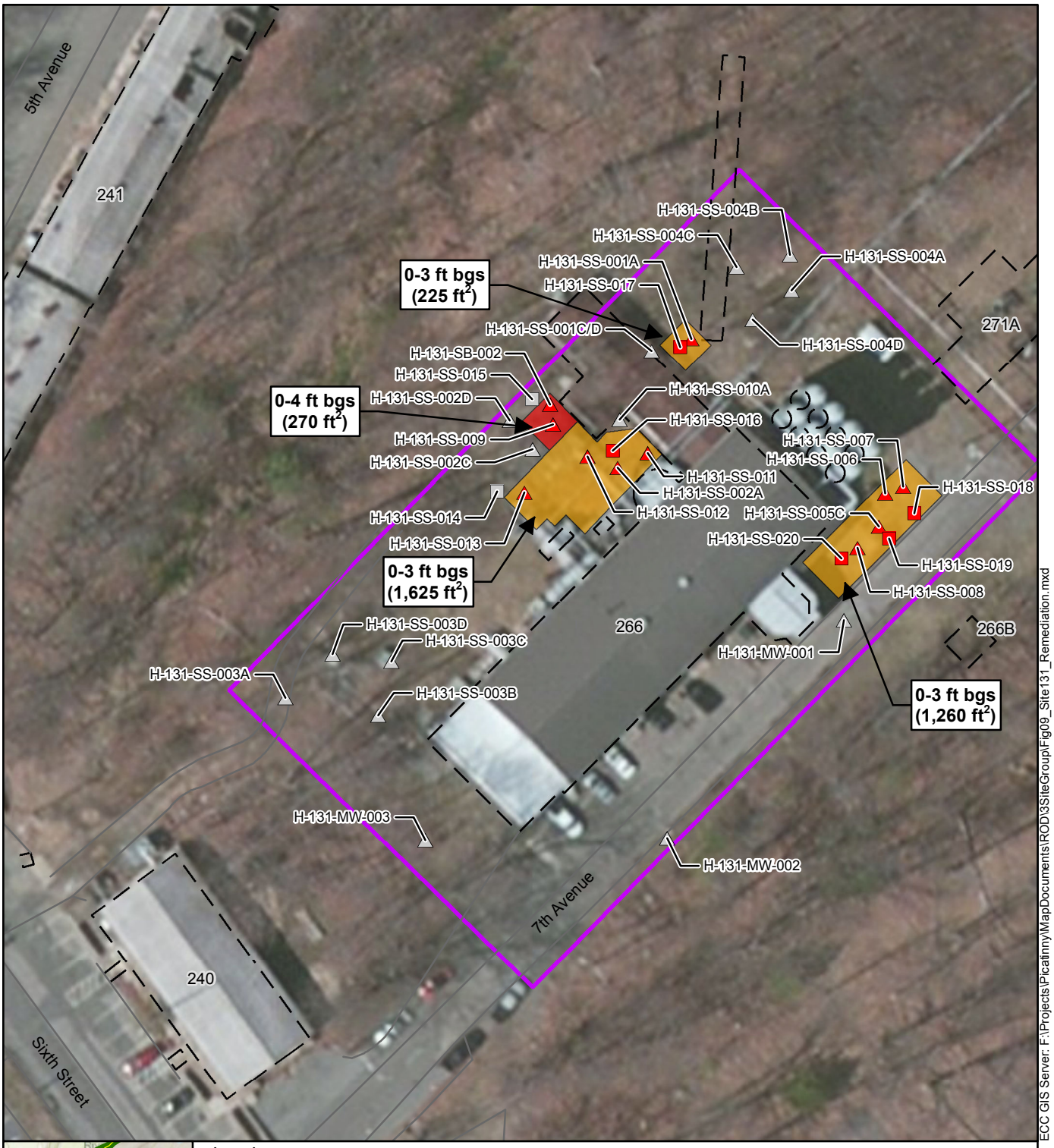
Figure 7
Soil Sample Exceedances of Cleanup Goals at Site 149/PICA-149

ECC GIS Server: F:\Projects\PicatinnyMapDocuments\ROD3SiteGroup\Fig07_Site149_SampLocs.mxd

ECC GIS Server: F:\Projects\PicatinnyMapDocuments\ROD\3SiteGroup\Fig08_Site118_Remediation.mxd

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

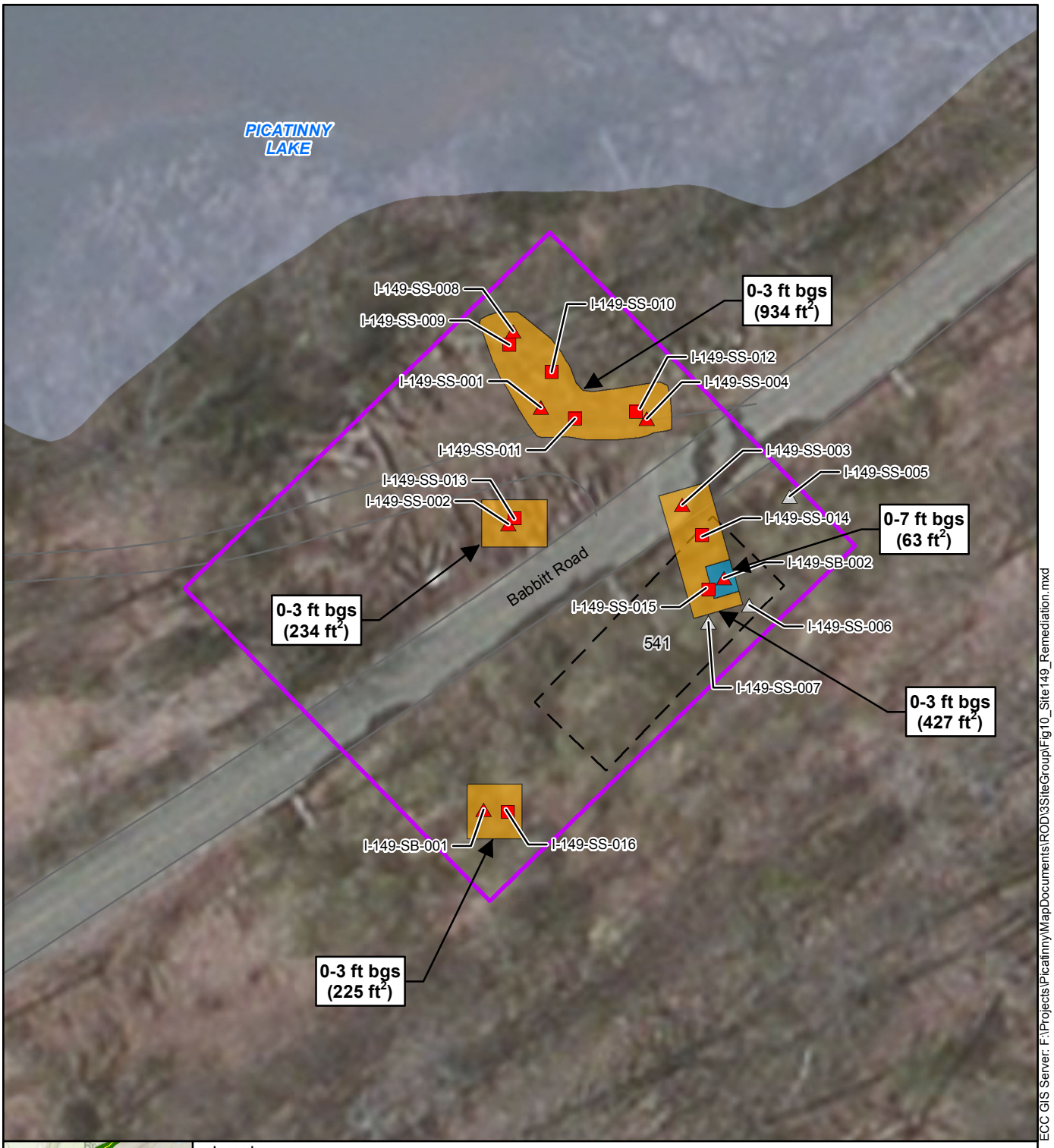
Figure 8
Site 118/PICA-097
Area of Remediation

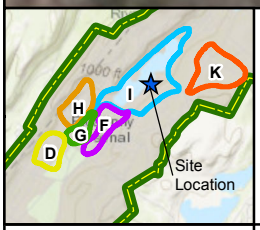


ECC GIS Server: F:\Projects\PicatinnyMapDocuments\ROD3SiteGroup\Fig09_Site131_Remediation.mxd

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 9
Site 131/PICA-131
Area of Remediation





Legend

- Site 149/PICA-149 Boundary for Area of Applicability of Land Use Controls
- Installation Boundary
- Former or Existing Building
- Water Bodies
- Road

Areas of Attainment

- 0-3 ft bgs
- 0-7 ft bgs

Sample Locations in March 2016

- Soil Sample where COPC concentration Exceeds Cleanup Goal
- Soil Sample where COPC concentrations Less Than Cleanup Goal

Previous Sample Locations

- Soil Sample where COPC concentration Exceeds Cleanup Goal
- Soil Sample where COPC concentrations Less Than Cleanup Goal

N W E S

Feet
0 10 20 40

ECC GIS Server: F:\Projects\PicatinnyMapDocuments\ROD3SiteGroup\Fig10_Site149_Remediation.mxd

PICATINNY ARSENAL
3 SITE GROUP RECORD OF DECISION SITES
PICATINNY, NEW JERSEY
MORRIS COUNTY

Figure 10
Site 149/PICA-149
Area of Remediation

Tables

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LIST OF TABLES

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Table 1
Chronology of Investigatory Events
Picatinny Arsenal, New Jersey

EVENT	DATE RANGE
Preliminary Assessments/Site Investigations (PA/SI)	1998
Remedial Investigations (RI)	1991-2005
Follow up activities on RI (additional sampling and/or focused remedial actions)	2004-2007
Feasibility Study	2007-2014

Table 2
Site Cleanup Goals and Concentrations of Contaminants of Concern in Soil
Picatinny Arsenal, New Jersey

Contaminant of Concern	Maximum Concentration Detected (mg/kg)	Cleanup Goal[(1)] (mg/kg)	Residential Cleanup Level[(3)] (mg/kg)
Site 118/PICA-097			
Arsenic	124	19[(2)]	19[(2)]
Dieldrin	0.5	0.2	0.04
Heptachlor epoxide	0.77	0.3	0.07
Lead	2,400	800	200
Thallium	587	79	5
Site 131/PICA-131			
Arsenic	1,440	19[(2)]	19[(2)]
Benzo(a)anthracene	4	2	0.6
Benzo(a)pyrene	4	0.2	0.2
Benzo(b)fluoranthene	4	2	0.6
Site 149/PICA-149			
2,4-Dinitrotoluene	630	3	0.7
Benzo(a)anthracene	11	2	0.6
Benzo(a)pyrene	13	0.2	0.2
Benzo(b)fluoranthene	20	2	0.6
Dibenz(a,h)anthracene	0.69	0.2	0.2
Indeno(1,2,3-c,d)pyrene	4.4	2	0.6

Notes:
mg/kg - milligrams per kilogram
[(1)]The cleanup goals used are the NJDEP NRDCSRS value as the Federal Regulations do not provide for soil standards. For any NRDCSRS values based on inhalation, the USEPA IRSL value was used as the cleanup goal. All Cleanup Goals listed here are NJDEP NRDCSRS values.
[(2)]The NJDEP Residential Direct Contact Soil Remediation Standard and NRDCSRS values for arsenic are based on natural background. In addition, the same value (19 mg/kg) has been documented as the Picatinny soil background value (IT, 2002).
[(3)]Residential cleanup levels are based on NJDEP Residential Direct Contact Soil Remediation Standards. Although these levels are not the cleanup goals for remediation of these sites, confirmatory data will be evaluated in comparison with residential criteria to determine whether sites can be closed post-remediation as UU/UE.
As provided in EPA OLEM (previously OSWER until December 2015) Directive 9200.2- 167, recent toxicological studies on lead suggest that adverse health effects are associated with mean BLLs less than 10 µg/dL in children. In response to the directive, the Region has developed a tiered approach for evaluating the extent of lead contaminated soil requiring a remedial action. The strategy is based on an updated regional risk reduction goal of no more than 5% of the target population exceeding a BLL of 5 µg/dL. Using the default IEUBK parameters and a target BLL of 5 µg/dL yields a value of 200 ppm.
To form a remedial strategy comprising both the state requirement of 400 mg/kg and recent toxicological findings reflecting the risk reduction goal stated above, a tiered approach is used to evaluate the extent of lead-contaminated soil requiring remedial action under residential cleanups. Specifically, individual detections of lead exceeding 400 mg/kg in surface soil (0-2 ft bgs) are evaluated as an initial PRG. Subsequently, the average lead concentration within the top two feet across the remediated area, calculated consistent with OSWER 9200.1-78, must be at or below 200 mg/kg once the selected remedial action targeting detections above 400 mg/kg is complete. Lead concentrations in clean backfill should not exceed 200 ppm. This evaluation accounts for the placement of clean backfill into excavated areas for the alternatives including this type of remediation.

Table 3
Summary of Human Health Risk Assessment Conclusions at Site 118/PICA-097, Site 131/PICA-131, Site 149/PICA-149
Picatinny Arsenal, New Jersey

Site/PICA	Media	Land Use Scenario	Population	Carcinogenic Risk	Primary Risk Drivers	Noncarcinogenic Hazard	Primary Risk Drivers	Lead
118/097	Surface Soil[1]	Current and Future	Industrial/Research Worker	2E-05	NR	10	Manganese Thallium	No concern
	Surface Soil[1]	Current and Future	Outdoor Maintenance Worker	1E-06	NR	<1	NH	
	Mixed Soil[2]	Current and Future	Construction/Excavation Worker	2E-05	NR	86	Manganese Thallium	
131/131	Surface Soil[1]	Current and Future	Industrial/Research Worker	2E-04	Arsenic	<1	NH	Not a COPC at this Site
	Mixed Soil[2]	Current and Future	Construction/Excavation Worker	1E-06	NR	<1	NH	
149/149	Surface Soil[1]	Current and Future	Industrial/Research Worker	2E-04	2,4-DNT	1	NH	Not a COPC at this Site
	Subsurface Soil[3]	Current and Future	Construction/Excavation Worker	1E-06	NR	0	NH	

Notes:
COPC – Contaminant of Potential Concern
DNT – Dinitrotoluene
NR – Not relevant. Cancer risk drivers not present because risk is within the generally acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$.
NC – No cancer risk calculated because none of the constituents present are considered carcinogenic.
NE – Not evaluated
NH – No carcinogenic hazard because hazard index does not exceed 1.

(1)Surface soil is defined as soil within the top two feet (ft) below ground surface.
(2)Mixed soil is defined as surface and subsurface soil evaluated together.
(3)Subsurface soil is defined as soil at depths greater than two ft below ground surface.

Table 4
Potential Chemical-Specific ARARs and TBC Guidance
Picatinny Arsenal, New Jersey

Media	Authority	Requirement	Status	Requirement Synopsis
Soil	State Criteria	New Jersey Remediation Standards, N.J.A.C. 7.26:D-4.3, 7:26D-5	ARAR	Soil Remediation Standards have been promulgated and regulate contaminants in soil.
Air	State Regulatory Requirement	New Jersey Ambient Air Quality Standards, N.J.A.C.7:27 13.3	To Be Considered	This guidance establishes reference concentrations for suspended particulate matter; such matter has the potential to be present during remedial excavation activities.

Table 5
Potential Location-Specific ARARs and TBC Guidance
Picatinny Arsenal, New Jersey

Authority	Requirement	Status	Requirement Synopsis
Federal Regulatory Requirement	Endangered Species Act 16 USC 1538(a)(1)	To Be Considered	Prohibits actions that jeopardize the continued existence of any listed species, results in a "taking" of any listed species.
State Regulatory Requirement	New Jersey Endangered and Non-Game Species Conservation Act 23:2A-6.	To Be Considered	Regulations states no person shall take, possess, transport, export, process, sell or offer for sale, or ship, species or subspecies of wildlife appearing on the any Federal list of endangered species.

Table 6
Potential Action-Specific ARARs and TBC Guidance
Picatinny Arsenal, New Jersey

Action	Requirement	Status	Requirement Synopsis
General Remediation and Institutional Controls	Technical Requirements for Site Remediation N.J.A.C. 7:26E-5.1(d)3	To Be Considered	Specifies that remediation must not cause an uncontrolled discharge or transfer of contaminants to another media. Requirement is substantive because it specifies a standard of control for on-site remedial action.
	Technical Requirements for Site Remediation N.J.A.C. 7:26E 1.5(h)	To Be Considered	Excavated soil may be returned to the original location provided neither free product nor residual protect is present Requirement is substantive because it provides a standard of control related to protectiveness of on-site action.
	Migratory Bird Treaty Act 16 USC 703(a)	To Be Considered	This regulation indicates actions taken (in this case, tree removal activities) which would result in the taking, killing, or possessing of migratory birds is unlawful, and includes any part, next or egg of such bird. Therefore, prior to any tree removal, confirmation would be necessary that migratory birds were not nesting within the trees.
	Technical Requirements for Site Remediation N.J.A.C. 7:26E 5.2 (b) through (f)	To Be Considered	Specifies the requirements for using alternative fill from an onsite or offsite source for backfilling excavations. Specifies the requirements for utilizing clean fill for backfilling excavations. Requirement is substantive because it dictates levels for soil allowable to be utilized as backfill.
Discharge of Aqueous Waste to Surface Water	Clean Water Act Effluent Guidelines 40 CFR 401.13, 401.15, 401.16, and 401.17	ARAR	The test procedures for measurement apply to pollutant amounts, characteristics or properties in effluent limitations guidelines standards of performance and pretreatment standards, and pH effluent limitations, where applicable. Requirement is substantive because it specifies the level or standard of control for potential discharge of stormwater resulting from remedial activities.

Table 6
Potential Action-Specific ARARs and TBC Guidance
Picatinny Arsenal, New Jersey

Action	Requirement	Status	Requirement Synopsis
Packaging, Labeling and Storage	RCRA Hazardous Waste Generation 40 CFR 262.30 40 CFR 262.34.	ARAR	Specifies requirements for hazardous waste Pre-Transport Requirements (packaging, labeling, marking). Potentially applicable to on-site requirements related to the off-site transportation of hazardous waste (off-site requirements are legally applicable but are not ARAR as they apply outside of the CERCLA process).
Disposal	RCRA Hazardous Waste Determination 40 CFR 262.11	ARAR	Requires the determination of whether a generated solid waste is a hazardous waste; specifies citations for exclusions, lists of hazardous wastes, and testing for determination.
Remedial excavation/ construction	Clean Air Act – National Emission Standards for Hazardous Air Pollutants (NESHAPS) - 40 CFR 63.545	ARAR	Engineering controls are required to reduce fugitive dust emissions while performing remedial activities, including continuous application of dust suppressants before, during, and after excavation.
	National Primary and Secondary Ambient Air Quality Standards 40 CFR 50.6, 50.7, and 50.8	ARAR	This regulation outlines restrictions and requirements for construction and remedial activities that emit particulate matter into the ambient air. Restrictions for air emissions from treatment technologies and nuisance and odor control are required.
Confirmatory Soil Sampling	Technical Requirements for Site Remediation N.J.A.C. 7:26E-4.2	ARAR	Specifies requirements of soil remediation and confirmatory and quality assurance sampling and analysis at remediation sites.

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Table 7
Summary of Response Action Costs
Picatinny Arsenal, New Jersey

Response Action	Estimated Capital Cost	Present Worth
SL-1[(1)]	**$0**	**$0**
SL-2	**$276,000**	**$488,000**
Site 118/PICA-097	$87,000	$157,000
Site 131/PICA-131	$86,000	$156,000
Site 149/PICA-149	$103,000	$175,000
SL-3	**$531,000**	**$870,000**
Site 118/PICA-097	$174,000	$285,000
Site 131/PICA-131	$198,000	$323,000
Site 149/PICA-149	$159,000	$262,000
SL-4	**$651,000**	**$855,000**
Site 118/PICA-097	$203,000	$271,000
Site 131/PICA-131	$256,000	$324,000
Site 149/PICA-149	$192,000	$260,000

Notes:
[(1)]No costs associated with this RA as it represents no action

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Table 8
Comparative Analysis of Remedial Alternatives for Site 118/PICA-097, Site 131/PICA-131, Site-149/PICA-149
Picatinny Arsenal, New Jersey

Criteria	Alternative SL-1 No Action	Alternative SL-2 Soil Cover with LUCs	Alternative SL-3 Asphalt Cover with LUCs	Alternative SL-4 Removal, Off-Site Disposal, and LUCs
Threshold Criteria				
Overall Protection of Human Health and the Environment	X	●	●	●
Compliance with ARARs	X	●	●	●
Balancing Criteria				
Long-Term Effectiveness and Permanence	X	◓	◓	●
Reduction of Toxicity, Mobility, or Volume through Treatment	X	●	●	●
Short-Term Effectiveness	X	◓	◓	◓
Implementability	●	◓	◓	◓
Cost	●	◓	◌	◌
Overall Score	X	◓	◓	●

Relative Ratings:

●	Excellent	◌	Adequate
◓	Good	X	Poor

Notes:
ARAR – Applicable or Relevant and Appropriate Requirement
LUCs - Land Use Controls

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Appendix A
Certificate of Publication for Public Notice

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AFFIDAVIT OF PUBLICATION

Publisher's Fee $53.68 Affidavit $35.00

State of New Jersey } **SS.**
Morris County

Personally appeared _____

Of the **Daily Record,** a newspaper printed in Secaucus, New Jersey and published in Parsippany, in said County and State, and of general circulation in said county, who being duly sworn, deposeth and saith that the advertisement of which the annexed is a true copy, has been published in the said newspaper 1 times, once in each issue as follows:

08/28/14 **A.D 2014**

_____

Sworn and subscribed before me, this 28 day of August, 2014

_____

Ad Number: 0000072054

Kathleen A. Gibson
Notary Public State of New Jersey
My Commission Expires Dec. 18, 2014

Ad Number: 0000072054 Run Dates: 08/28/14

NEW JERSEY

PUBLIC NOTICE
U.S. ARMY INVITES PUBLIC COMMENT ON PROPOSED PLAN
FOR SITES 118, 131 and 149 AT PICATINNY

PROPOSED PLAN FOR THREE SITES AT PICATINNY ARSENAL

The US Army's Environmental Program at Picatinny Arsenal invites public comment on a Proposed Plan for three sites (118, 131 and 149). Site 118 (Building 41) was used for the storage of pesticides and herbicides for use on the golf course and lawn. Site 131 (Building 266) was a former ordnance manufacturing facility. Site 149 (Building 541) was a propellant plant. Picatinny's Master Plan designates future use of these areas as military and industrial within a secured Army base. There are no plans to change this land use in the foreseeable future. Various chemicals have been used at these sites, and soil, sediment, surface water and groundwater have been sampled and studied. Groundwater at Sites 118 and 131 is being addressed through other actions underway. Surface water and sediment at Site 118 is being addressed through a separate action for Green Pond Brook/Bear Swamp Brook. Some metals, insecticides and polycyclic aromatic hydrocarbons (PAHs) have been detected in the soil at the three sites.

Alternatives Evaluated

The Army evaluated four alternatives for addressing soil at the three sites:

1. No Action.
2. Soil Cover with Land Use Controls.
3. Asphalt Cover with Land Use Controls.
4. Removal, Off-Site Disposal, and Land Use Controls.

The preferred alternatives is Alternative 4. Soils with compounds exceeding set levels would be excavated and disposed of at an appropriate landfill. If concentrations remain above cleanup goals at the excavation floor, the resulting backfill will be maintained as a soil cover. Land use controls would be put in place, and annual reporting would document no changes in land use and the condition of the soil cover, if required.

Proposed Plan Public Meeting

The Army invites the public to attend a meeting on Thursday, September 11, 2014, 7:00 p.m., Hilton Garden Inn (near the Rockaway Townsquare Mall), 375 Mt. Hope Avenue, Rockaway, NJ, 07866. The meeting location is wheelchair accessible.

Written Comments

Copies of the Remedial Investigation, Feasibility Study, and Proposed Plan for these sites is available for public review at the Environmental Affairs Directorate at Picatinny by contacting Mr. Ted Gabel at (973) 724-6748 or ted.b.gabel.civ@mail.mil in advance. A copy of the Proposed Plan and the electronic version of the Remedial Investigation and Feasibility Study for these sites will be available for review at the Rockaway Township Library (61 Mount Hope Road) and Morris County Library (30 East Hanover Avenue, Whippany). In addition, you can have the Proposed Plan emailed to you by contacting Mr. Ted Gabel by email.

The public may submit written comments during the 30-day comment period (September 11 to October 11, 2014). Comments must be postmarked by October 11, 2014 and sent to Mr. Ted Gabel, U.S. Army Garrison, Picatinny Arsenal, IMPI-PWE, Building 319, Picatinny Arsenal, NJ, 07806-5000 or by email to ted.b.gabel.civ@mail.mil.

($53.68) 72054

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STATE OF NEW JERSEY
COUNTY OF ESSEX } SS

Keisha Blackmon

Being duly sworn, according to law, on his/her oath sayeth that he/she is CLERK of the Star-Ledger, in the County of Essex, and that the notice, of which the attached is a copy, was published in said paper on the 3rd day of September 2014 and continued therin for 1 day successively, at least once in each

for Keisha Blackmon

Sworn to and subscribed
before me this 5th
day of November, 2014

NOTARY PUBLIC of NEW JERSEY

MEDINAH Y. JONES
Notary Public, State of New Jersey
My Commission Expires
January 18, 2018

MEDINAH Y. JONES
NOTARY PUBLIC
STATE OF NEW JERSEY

Appendix B
Historical Analytical Results

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Unit	Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
			Location ID	D-118-SS-004	D-118-SS-005	D-118-SS-006	D-118-SS-007	D-118-SS-008	D-118-SS-009	D-118-SS-010A	D-118-SS-011	D-118-SS-012	D-118-SS-013	D-118-SS-014	D-118-SS-015	D-118-SS-016	D-118-SS-017	D-118-SS-018	D-118-SS-019
			Sample Date	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	9/15/2000	8/28/2000	9/15/2000	9/15/2000	9/15/2000	8/28/2000	8/28/2000	4/24/2001	4/24/2001	4/24/2001	4/24/2001
			Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1
			Sample ID	118SS-4A(0-1)	118SS-5A(0-1)	118SS-6A(0-1)	118SS-7A(0-1)	118SS-8B(1-2)	118SS-9A(0-1)	118SS-10A(0-1)	118SS-11A(0-1)	118SS-12B(1-2)	118SS-13A(0-1)	118SS-14A(0-1)	118SS-15A(0-1)	118SS-16B(1-2)	118SS-17A(0-1)	118SS-18A(0-1)	118SS-19A(0-1)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Explosives																			
1,3,5-Trinitrobenzene	99-35-4	mg/kg																	
1,3-Dinitrobenzene	99-65-0	mg/kg																	
2,4,6-Trinitrotoluene	118-96-7	mg/kg																	
3-Nitrotoluene	99-08-1	mg/kg																	
HMX	2691-41-0	mg/kg																	
Nitrobenzene	98-95-3	mg/kg																	
Nitrobenzene	98-95-3	mg/kg																	
Nitrocellulose	9004-70-0	mg/kg																	
Nitroglycerin	55-63-0	mg/kg																	
PETN	78-11-5	mg/kg																	
RDX	121-82-4	mg/kg																	
Tetryl	479-45-8	mg/kg																	
Explosives / SVOC																			
2,4-Dinitrotoluene	121-14-2	mg/kg																	
2,4-Dinitrotoluene	121-14-2	mg/kg																	
2,6-Dinitrotoluene	606-20-2	mg/kg																	
2,6-Dinitrotoluene	606-20-2	mg/kg																	
Herbicide																			
Merphos	150-50-5	mg/kg																	
Metals																			
Aluminum	7429-90-5	mg/kg																	
Antimony	7440-36-0	mg/kg																	
Arsenic	7440-38-2	mg/kg		124 JD	52.1 JD	20.6 J	24 J	21.5 J								21.5 D	17.6 D	80.9 D	46.3 D
Barium	7440-39-3	mg/kg																	
Beryllium	7440-41-7	mg/kg							< 2.8 UD	< 1.1 UD	< 6.3 UD	< 7.6 UD							
Cadmium	7440-43-9	mg/kg																	
Calcium	7440-70-2	mg/kg																	
Chromium	7440-47-3	mg/kg																	
Cobalt	7440-48-4	mg/kg																	
Copper	7440-50-8	mg/kg																	
Iron	7439-89-6	mg/kg																	
Lead	7439-92-1	mg/kg							159 JD	23.4 JD	303 JD	12.8 JD							
Magnesium	7439-95-4	mg/kg																	
Manganese	7439-96-5	mg/kg																	
Mercury	7439-97-6	mg/kg																	
Nickel	7440-02-0	mg/kg																	
Potassium	7440-09-7	mg/kg																	
Selenium	7782-49-2	mg/kg																	
Silver	7440-22-4	mg/kg																	
Sodium	7440-23-5	mg/kg																	
Thallium	7440-28-0	mg/kg											6.8 JD	< 4.8 UJD	< 4.4 UJD				
Vanadium	7440-62-2	mg/kg																	
Zinc	7440-66-6	mg/kg																	
Other																			
1,4-Oxathiane	15980-15-1	mg/kg																	
Dithiane	51330-42-8	mg/kg																	
PCBs																			
Aroclor 1016	12674-11-2	mg/kg																	
Aroclor 1016	12674-11-2	mg/kg																	
Aroclor 1221	11104-28-2	mg/kg																	
Aroclor 1232	11141-16-5	mg/kg																	
Aroclor 1242	53469-21-9	mg/kg																	
Aroclor 1248	12672-29-6	mg/kg																	
Aroclor 1254	11097-69-1	mg/kg																	
Aroclor 1260	11096-82-5	mg/kg																	
Aroclor 1260	11096-82-5	mg/kg																	
Aroclor 1262	37324-23-5	mg/kg																	

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Unit	Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
			Location ID	D-118-SS-004	D-118-SS-005	D-118-SS-006	D-118-SS-007	D-118-SS-008	D-118-SS-009	D-118-SS-010A	D-118-SS-011	D-118-SS-012	D-118-SS-013	D-118-SS-014	D-118-SS-015	D-118-SS-016	D-118-SS-017	D-118-SS-018	D-118-SS-019
			Sample Date	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	9/15/2000	8/28/2000	9/15/2000	9/15/2000	9/15/2000	8/28/2000	8/28/2000	4/24/2001	4/24/2001	4/24/2001	4/24/2001
			Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1
			Sample ID	118SS-4A(0-1)	118SS-5A(0-1)	118SS-6A(0-1)	118SS-7A(0-1)	118SS-8B(1-2)	118SS-9A(0-1)	118SS-10A(0-1)	118SS-11A(0-1)	118SS-12B(1-2)	118SS-13A(0-1)	118SS-14A(0-1)	118SS-15A(0-1)	118SS-16B(1-2)	118SS-17A(0-1)	118SS-18A(0-1)	118SS-19A(0-1)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Pesticides																			
4,4'-DDD	72-54-8	mg/kg																	
4,4'-DDD	72-54-8	mg/kg																	
4,4'-DDE	72-55-9	mg/kg																	
4,4'-DDE	72-55-9	mg/kg																	
4,4'-DDT	50-29-3	mg/kg																	
4,4'-DDT	50-29-3	mg/kg																	
Aldrin	309-00-2	mg/kg																	
Aldrin	309-00-2	mg/kg																	
alpha-BHC	319-84-6	mg/kg																	
alpha-BHC	319-84-6	mg/kg																	
Atrazine	1912-24-9	mg/kg																	
Azinphos methyl	86-50-0	mg/kg																	
beta-BHC	319-85-7	mg/kg																	
beta-BHC	319-85-7	mg/kg																	
Bolstar	35400-43-2	mg/kg																	
Chlordane	57-74-9	mg/kg																	
Chlordane	57-74-9	mg/kg																	
Chlorpyrifos	2921-88-2	mg/kg																	
Coumaphos	56-72-4	mg/kg																	
delta-BHC	319-86-8	mg/kg																	
delta-BHC	319-86-8	mg/kg																	
Demeton-S	126-75-0	mg/kg																	
Diazinon	333-41-5	mg/kg																	
Dieldrin	60-57-1	mg/kg																	
Dieldrin	60-57-1	mg/kg																	
Disulfoton	298-04-4	mg/kg																	
Endosulfan I	959-98-8	mg/kg																	
Endosulfan I	959-98-8	mg/kg																	
Endosulfan II	33213-65-9	mg/kg																	
Endosulfan II	33213-65-9	mg/kg																	
Endosulfan sulfate	1031-07-8	mg/kg																	
Endosulfan sulfate	1031-07-8	mg/kg																	
Endrin	72-20-8	mg/kg																	
Endrin	72-20-8	mg/kg																	
Endrin aldehyde	7421-93-4	mg/kg																	
Endrin ketone	53494-70-5	mg/kg																	
Ethoprop	13194-48-4	mg/kg																	
Fenchlorphos	299-84-3	mg/kg																	
Fensulfothion	115-90-2	mg/kg																	
Fenthion	55-38-9	mg/kg																	
gamma-BHC (Lindane)	58-89-9	mg/kg																	
gamma-BHC (Lindane)	58-89-9	mg/kg																	
Heptachlor	76-44-8	mg/kg																	
Heptachlor	76-44-8	mg/kg																	
Heptachlor epoxide	1024-57-3	mg/kg																	
Heptachlor epoxide	1024-57-3	mg/kg																	
Isodrin	465-73-6	mg/kg																	
Isodrin	465-73-6	mg/kg																	
Malathion	121-75-5	mg/kg																	
Methoxychlor	72-43-5	mg/kg																	
Methoxychlor	72-43-5	mg/kg																	
Methyl parathion	298-00-0	mg/kg																	
Mevinphos	7786-34-7	mg/kg																	
Mirex	2385-85-5	mg/kg																	
Naled	300-76-5	mg/kg																	
Parathion	56-38-2	mg/kg																	
p-Chlorophenylmethyl sulfide	123-09-1	mg/kg																	
p-Chlorophenylmethyl sulfone	98-57-7	mg/kg																	
p-Chlorophenylmethyl sulfoxide	934-73-6	mg/kg																	

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
		Location ID	D-118-SS-004	D-118-SS-005	D-118-SS-006	D-118-SS-007	D-118-SS-008	D-118-SS-009	D-118-SS-010A	D-118-SS-011	D-118-SS-012	D-118-SS-013	D-118-SS-014	D-118-SS-015	D-118-SS-016	D-118-SS-017	D-118-SS-018	D-118-SS-019
		Sample Date	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	9/15/2000	8/28/2000	9/15/2000	9/15/2000	9/15/2000	8/28/2000	8/28/2000	4/24/2001	4/24/2001	4/24/2001	4/24/2001
		Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1
		Sample ID	118SS-4A(0-1)	118SS-5A(0-1)	118SS-6A(0-1)	118SS-7A(0-1)	118SS-8B(1-2)	118SS-9A(0-1)	118SS-10A(0-1)	118SS-11A(0-1)	118SS-12B(1-2)	118SS-13A(0-1)	118SS-14A(0-1)	118SS-15A(0-1)	118SS-16B(1-2)	118SS-17A(0-1)	118SS-18A(0-1)	118SS-19A(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit																
Phorate	298-02-2	mg/kg																
Prothiophos	24643-46-4	mg/kg																
Stirophos	961-11-5	mg/kg																
Supona	470-90-6	mg/kg																
Toxaphene	8001-35-2	mg/kg																
Toxaphene	8001-35-2	mg/kg																
Vapona	62-73-7	mg/kg																
Vapona	62-73-7	mg/kg																
SVOC																		
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg																
1,2,4-Trichlorobenzene	120-82-1	mg/kg																
1,2-Dichlorobenzene	95-50-1	mg/kg																
1,2-Diphenylhydrazine	122-66-7	mg/kg																
1,3-Dichlorobenzene	541-73-1	mg/kg																
1,3-Dichlorobenzene	541-73-1	mg/kg																
1,4-Dichlorobenzene	106-46-7	mg/kg																
2,4,5-Trichlorophenol	95-95-4	mg/kg																
2,4,6-Trichlorophenol	88-06-2	mg/kg																
2,4-Dichlorophenol	120-83-2	mg/kg																
2,4-Dimethylphenol	105-67-9	mg/kg																
2,4-Dinitrophenol	51-28-5	mg/kg																
2,6-Dinitroaniline	606-22-4	mg/kg																
2-Chloronaphthalene	91-58-7	mg/kg																
2-Chlorophenol	95-57-8	mg/kg																
2-Methylnaphthalene	91-57-6	mg/kg																
2-Methylphenol	95-48-7	mg/kg																
2-Nitrophenol	88-75-5	mg/kg																
3,3'-Dichlorobenzidine	91-94-1	mg/kg																
3,5-Dinitroaniline	618-87-1	mg/kg																
3-Nitroaniline	99-09-2	mg/kg																
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg																
4-Bromophenyl phenyl ether	101-55-3	mg/kg																
4-Chloro-3-methylphenol	59-50-7	mg/kg																
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg																
4-Methylphenol	106-44-5	mg/kg																
4-Nitrophenol	100-02-7	mg/kg																
Acenaphthene	83-32-9	mg/kg																
Acenaphthylene	208-96-8	mg/kg																
Anthracene	120-12-7	mg/kg																
Benz(a)anthracene	56-55-3	mg/kg																
Benzo(a)pyrene	50-32-8	mg/kg																
Benzo(b)fluoranthene	205-99-2	mg/kg																
Benzo(g,h,i)perylene	191-24-2	mg/kg																
Benzo(k)fluoranthene	207-08-9	mg/kg																
Benzyl alcohol	100-51-6	mg/kg																
bis(2-Chloroethoxy)methane	111-91-1	mg/kg																
bis(2-Chloroethyl)ether	111-44-4	mg/kg																
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg																
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg																
Butylbenzyl phthalate	85-68-7	mg/kg																
Chrysene	218-01-9	mg/kg																
Dibenz(a,h)anthracene	53-70-3	mg/kg																
Dibenzofuran	132-64-9	mg/kg																
Dichlorobenzenes	25321-22-6	mg/kg																
Dicyclopentadiene	77-73-6	mg/kg																
Diethylphthalate	84-66-2	mg/kg																
Dimethylphthalate	131-11-3	mg/kg																
di-n-Butylphthalate	84-74-2	mg/kg																
di-n-Octylphthalate	117-84-0	mg/kg																
Fluoranthene	206-44-0	mg/kg																

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
		Location ID	D-118-SS-004	D-118-SS-005	D-118-SS-006	D-118-SS-007	D-118-SS-008	D-118-SS-009	D-118-SS-010A	D-118-SS-011	D-118-SS-012	D-118-SS-013	D-118-SS-014	D-118-SS-015	D-118-SS-016	D-118-SS-017	D-118-SS-018	D-118-SS-019
		Sample Date	8/28/2000	8/28/2000	8/28/2000	8/28/2000	8/28/2000	9/15/2000	8/28/2000	9/15/2000	9/15/2000	9/15/2000	8/28/2000	8/28/2000	4/24/2001	4/24/2001	4/24/2001	4/24/2001
		Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1	1 - 2	0 - 1	0 - 1	0 - 1
		Sample ID	118SS-4A(0-1)	118SS-5A(0-1)	118SS-6A(0-1)	118SS-7A(0-1)	118SS-8B(1-2)	118SS-9A(0-1)	118SS-10A(0-1)	118SS-11A(0-1)	118SS-12B(1-2)	118SS-13A(0-1)	118SS-14A(0-1)	118SS-15A(0-1)	118SS-16B(1-2)	118SS-17A(0-1)	118SS-18A(0-1)	118SS-19A(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
		Unit																
Fluorene	86-73-7	mg/kg																
Hexachlorobenzene	118-74-1	mg/kg																
Hexachlorobutadiene	87-68-3	mg/kg																
Hexachlorocyclopentadiene	77-47-4	mg/kg																
Hexachloroethane	67-72-1	mg/kg																
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg																
Isophorone	78-59-1	mg/kg																
Naphthalene	91-20-3	mg/kg																
N-Nitrosodimethylamine	62-75-9	mg/kg																
n-Nitroso-di-n-propylamine	621-64-7	mg/kg																
n-Nitrosodiphenylamine	86-30-6	mg/kg																
Pentachlorophenol	87-86-5	mg/kg																
Phenanthrene	85-01-8	mg/kg																
Phenol	108-95-2	mg/kg																
Pyrene	129-00-0	mg/kg																
VOC																		
1,1,1-Trichloroethane	71-55-6	mg/kg																
1,1,2-Trichloroethane	79-00-5	mg/kg																
1,1-Dichloroethane	75-34-3	mg/kg																
1,1-Dichloroethene	75-35-4	mg/kg																
1,2,3-Trichlorobenzene	87-61-6	mg/kg																
1,2-Dichloroethane	107-06-2	mg/kg																
1,2-Dichloroethene (total)	540-59-0	mg/kg																
1,2-Dichloropropane	78-87-5	mg/kg																
1,3-Dichloropropane	142-28-9	mg/kg																
2,3,6-Trichlorophenol	933-75-5	mg/kg																
2-Butanone	78-93-3	mg/kg																
2-Chloroethyl vinyl ether	110-75-8	mg/kg																
4-Methyl-2-pentanone (MIBK)	108-10-1	mg/kg																
Acetone	67-64-1	mg/kg																
Acrylonitrile	107-13-1	mg/kg																
Benzene	71-43-2	mg/kg																
Bromodichloromethane	75-27-4	mg/kg																
Bromoform	75-25-2	mg/kg																
Bromomethane	74-83-9	mg/kg																
Carbon tetrachloride	56-23-5	mg/kg																
Chlorobenzene	108-90-7	mg/kg																
Chloroethane	75-00-3	mg/kg																
Chloroform	67-66-3	mg/kg																
Chloromethane	74-87-3	mg/kg																
Dibromochloromethane	124-48-1	mg/kg																
Dibromochloropropane	96-12-8	mg/kg																
Ethyl benzene	100-41-4	mg/kg																
Methylene chloride	75-09-2	mg/kg																
m-Xylenes	108-38-3	mg/kg																
Tetrachloroethene	127-18-4	mg/kg																
Toluene	108-88-3	mg/kg																
Trichloroethene	79-01-6	mg/kg																
Trichlorofluoromethane	75-69-4	mg/kg																
Vinyl chloride	75-01-4	mg/kg																
Xylenes	1330-20-7	mg/kg																
WetChem																		
% Solids	%Solid	%	50.2	82.9	91.5	62.3	81	89.5	89.1	79.3	66	72.2	83.4	91.4	77	84.2	87.5	60.6
Cyanide	57-12-5	mg/kg																

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Site Name / Location ID / Sample Date / Depth Interval / Sample ID / Sample Matrix / Unit	118 D-SB118-1 11/2/1993 0 - 2 SB118-1A(0-2) SO	118 D-SB118-1 11/2/1993 0 - 2 SB118-1B(0-2) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1C(2-4) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1CD(2-4) SO	118 D-SB118-1 11/2/1993 4 - 6 SB118-1D(4-6) SO	118 D-SS118-1 10/20/1993 .5 - 1 SS118-1B(0.5-1) SO	118 D-SS118-1 10/20/1993 0 - .5 SS118-1A(0-0.5) SO	118 D-SS118-2 10/20/1993 .5 - 1 SS118-2B(0.5-1) SO	118 D-SS118-2 10/20/1993 0 - .5 SS118-2A(0-0.5) SO	118 D-SS118-3 10/20/1993 0 - .5 SS118-3A(0-0.5) SO	118 D-SS118-3 10/20/1993 .5 - 1 SS118-3B(0.5-1) SO
Explosives													
1,3,5-Trinitrobenzene	99-35-4	mg/kg			< 0.922 U	< 0.922 U					< 0.922 U		
1,3-Dinitrobenzene	99-65-0	mg/kg			< 0.504 U	< 0.504 U					< 0.504 U		
2,4,6-Trinitrotoluene	118-96-7	mg/kg			< 2 U	< 2 U					< 2 U		
3-Nitrotoluene	99-08-1	mg/kg	< 0.34 U		< 0.34 U	< 0.34 U	< 0.34 U		< 0.34 U		< 0.34 U	< 0.34 U	
HMX	2691-41-0	mg/kg			< 2 U	< 2 U					< 2 U		
Nitrobenzene	98-95-3	mg/kg	< 1.8 U		< 1.8 U	< 1.14 U	< 1.8 U		< 1.8 U		< 1.8 U	< 1.8 U	
Nitrobenzene	98-95-3	mg/kg			< 1.14 U	< 1.8 U					< 1.14 U		
Nitrocellulose	9004-70-0	mg/kg			109 B	64.4 B					< 23.1 U		
Nitroglycerin	55-63-0	mg/kg			< 0.51 U	< 0.51 U					< 0.51 U		
PETN	78-11-5	mg/kg			< 1 U	< 1 U					< 1 U		
RDX	121-82-4	mg/kg			< 1.28 U	< 1.28 U					< 1.28 U		
Tetryl	479-45-8	mg/kg			< 2.11 U	< 2.11 U					< 2.11 U		
Explosives / SVOC													
2,4-Dinitrotoluene	121-14-2	mg/kg	< 1.4 U		< 2.5 U	< 2.5 U	< 1.4 U		< 1.4 U		< 2.5 U	< 1.4 U	
2,4-Dinitrotoluene	121-14-2	mg/kg			< 1.4 U	< 1.4 U					< 1.4 U		
2,6-Dinitrotoluene	606-20-2	mg/kg	< 0.32 U		< 0.32 U	< 0.32 U	< 0.32 U		< 0.32 U		< 2 U	< 0.32 U	
2,6-Dinitrotoluene	606-20-2	mg/kg			< 2 U	< 2 U					< 0.32 U		
Herbicide													
Merphos	150-50-5	mg/kg							< 0.067 U		< 0.067 U	< 0.067 U	
Metals													
Aluminum	7429-90-5	mg/kg	21000		7140	7600	6260		10800		13900	37600	
Antimony	7440-36-0	mg/kg	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U		< 1 U	1.4	
Arsenic	7440-38-2	mg/kg	13.7		4.11	4.33	< 2.5 U		30.7		15.1	17	
Barium	7440-39-3	mg/kg	923		69.3	47.2	44.6		241		80.3	372	
Beryllium	7440-41-7	mg/kg	1.78		< 0.427 U	< 0.427 U	< 0.427 U		1.67		0.66	4.96	
Cadmium	7440-43-9	mg/kg	< 1.2 U		< 1.2 U	< 1.2 U	< 1.2 U		< 1.2 U		< 1.2 U	3.2	
Calcium	7440-70-2	mg/kg	49100		2820	2840	2780		6310		2210	110000 D	
Chromium	7440-47-3	mg/kg	12.8		10.3	10.5	11.2		24.4		16.5	84.2	
Cobalt	7440-48-4	mg/kg	13.7		6.65	6.8	8.97		9.49		5.08	13.8	
Copper	7440-50-8	mg/kg	66.2		22.5	21.2	15.7		34		14	95.5	
Iron	7439-89-6	mg/kg	35100		14700	15000	14600		13200		12600	39100	
Lead	7439-92-1	mg/kg	30.6		< 7.44 U	13	< 7.44 U		41		16.4	2400 D	
Magnesium	7439-95-4	mg/kg	11200		3200	3530	3070		1630		2490	32000	
Manganese	7439-96-5	mg/kg	13000 D		648	497	494		458		140	1700 D	
Mercury	7439-97-6	mg/kg	< 0.05 U		< 0.05 U	< 0.05 U	< 0.05 U		0.28		0.16	3.1 D	
Nickel	7440-02-0	mg/kg	12.5		10.2	11.1	11.7		17.5		12.4	16.4	
Potassium	7440-09-7	mg/kg	525		675	656	747		649		912	1540	
Selenium	7782-49-2	mg/kg	< 0.449 U		< 0.449 U	< 0.449 U	< 0.449 U		1.71		0.64	< 0.449 U	
Silver	7440-22-4	mg/kg	< 0.803 U		< 0.803 U	< 0.803 U	< 0.803 U		< 0.803 U		< 0.803 U	< 0.803 U	
Sodium	7440-23-5	mg/kg	1490		232	247	140		287		77.7	2030	
Thallium	7440-28-0	mg/kg	587		< 34.3 U	< 34.3 U	< 34.3 U		< 34.3 U		< 34.3 U	< 34.3 U	
Vanadium	7440-62-2	mg/kg	63.1		16	16.6	14.3		32.5		26.1	57.1	
Zinc	7440-66-6	mg/kg	45.6		33	35.1	33.2		71		32.2	724	
Other													
1,4-Oxathiane	15980-15-1	mg/kg	< 0.075 U		< 0.075 U	< 0.075 U	< 0.075 U		< 0.075 U		< 0.075 U	< 0.075 U	
Dithiane	51330-42-8	mg/kg	< 0.065 U		< 0.065 U	< 0.065 U	< 0.065 U		< 0.065 U		< 0.065 U	< 0.065 U	
PCBs													
Aroclor 1016	12674-11-2	mg/kg	< 0.1 U		< 0.32 U	< 0.32 U	< 0.32 U		< 0.32 U		< 0.32 U	< 0.32 U	
Aroclor 1016	12674-11-2	mg/kg	< 0.32 U		< 0.1 U	< 0.1 U	< 0.1 U		< 0.1 U		< 0.1 U	< 0.1 U	
Aroclor 1221	11104-28-2	mg/kg	< 0.1 UT		< 0.1 UT	< 0.1 UT	< 0.1 UT		< 0.1 UT		< 0.1 UT	< 0.1 UT	
Aroclor 1232	11141-16-5	mg/kg	< 0.1 UT		< 0.1 UT	< 0.1 UT	< 0.1 UT		< 0.1 UT		< 0.1 UT	< 0.1 UT	
Aroclor 1242	53469-21-9	mg/kg	< 0.1 UT		< 0.1 UT	< 0.1 UT	< 0.1 UT		< 0.1 UT		< 0.1 UT	< 0.1 UT	
Aroclor 1248	12672-29-6	mg/kg	< 0.1 UT		< 0.1 UT	< 0.1 UT	< 0.1 UT		< 0.1 UT		< 0.1 UT	< 0.1 UT	
Aroclor 1254	11097-69-1	mg/kg	< 0.0479 UT		< 0.0479 UT	< 0.0479 UT	< 0.0479 UT		< 0.0479 UT		< 0.0479 UT	< 0.0479 UT	
Aroclor 1260	11096-82-5	mg/kg	< 0.0479 U		< 0.79 U	< 0.0479 U	< 0.0479 U		< 0.79 U		< 0.79 U	< 0.0479 U	
Aroclor 1260	11096-82-5	mg/kg	< 0.79 U		< 0.0479 U	< 0.79 U	< 0.79 U		< 0.0479 U		< 0.0479 U	< 0.79 U	
Aroclor 1262	37324-23-5	mg/kg	< 6.3 U		< 6.3 U	< 6.3 U	< 6.3 U		< 6.3 U		< 6.3 U	< 6.3 U	

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Site Name / Location ID / Sample Date / Depth Interval / Sample ID / Sample Matrix / Unit	118 D-SB118-1 11/2/1993 0 - 2 SB118-1A(0-2) SO	118 D-SB118-1 11/2/1993 0 - 2 SB118-1B(0-2) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1C(2-4) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1CD(2-4) SO	118 D-SB118-1 11/2/1993 4 - 6 SB118-1D(4-6) SO	118 D-SS118-1 10/20/1993 .5 - 1 SS118-1B(0.5-1) SO	118 D-SS118-1 10/20/1993 0 - .5 SS118-1A(0-0.5) SO	118 D-SS118-2 10/20/1993 .5 - 1 SS118-2B(0.5-1) SO	118 D-SS118-2 10/20/1993 0 - .5 SS118-2A(0-0.5) SO	118 D-SS118-3 10/20/1993 0 - .5 SS118-3A(0-0.5) SO	118 D-SS118-3 10/20/1993 .5 - 1 SS118-3B(0.5-1) SO
Pesticides													
4,4'-DDD	72-54-8	mg/kg	< 0.064 U		< 0.27 U	< 0.064 U	< 0.064 U		0.03		0.03	0.06 N	
4,4'-DDD	72-54-8	mg/kg	< 0.27 U		< 0.064 U	< 0.27 U	< 0.27 U		< 0.064 U		< 0.064 U	< 0.064 U	
4,4'-DDE	72-55-9	mg/kg	0.11 D		0.03	< 0.068 U	< 0.068 U		< 0.068 U		< 0.068 U	0.06	
4,4'-DDE	72-55-9	mg/kg	< 0.068 U		< 0.068 U	0.02	0.05		0.09		0.06	< 0.068 U	
4,4'-DDT	50-29-3	mg/kg	< 0.1 U		< 0.1 U	< 0.1 U	< 0.1 U		0.12		0.1	< 0.1 U	
4,4'-DDT	50-29-3	mg/kg	0.42 D		0.1	0.09	0.16 D		< 0.1 U		< 0.1 U	0.18 D	
Aldrin	309-00-2	mg/kg	< 1.3 U		< 0.14 UJ	< 1.3 U	< 0.14 UJ		< 1.3 U		< 1.3 U	< 1.3 U	
Aldrin	309-00-2	mg/kg	< 0.14 UJ		< 1.3 U	< 0.14 UJ	< 1.3 U		< 0.14 U		< 0.14 U	< 0.14 U	
alpha-BHC	319-84-6	mg/kg	< 1.3 U		< 0.28 U	< 0.28 U	< 0.28 U		< 0.28 U		< 0.28 U	< 0.28 U	
alpha-BHC	319-84-6	mg/kg	< 0.28 U		< 1.3 U	< 1.3 U	< 1.3 U		< 1.3 U		< 1.3 U	< 1.3 U	
Atrazine	1912-24-9	mg/kg	< 0.065 U		< 0.065 U	< 0.065 U	< 0.065 U		< 0.065 U		< 0.065 U	< 0.065 U	
Azinphos methyl	86-50-0	mg/kg							< 0.067 U		< 0.067 U	< 0.067 U	
beta-BHC	319-85-7	mg/kg	< 1.3 U		< 0.77 U	< 0.77 U	< 0.77 U		< 1.3 U		< 0.77 U	< 0.77 U	
beta-BHC	319-85-7	mg/kg	< 0.77 U		< 1.3 U	< 1.3 U	< 1.3 U		< 0.77 U		< 1.3 U	< 1.3 U	
Bolstar	35400-43-2	mg/kg							< 0.067 U		< 0.067 U	< 0.067 U	
Chlordane	57-74-9	mg/kg	< 0.0684 U		< 0.68 U	< 0.0684 U	< 0.68 U		0.88		< 0.68 U	0.62	
Chlordane	57-74-9	mg/kg	< 0.68 U		< 0.0684 U	< 0.68 U	< 0.0684 U		< 0.68 U		0.25	< 0.68 U	
Chlorpyrifos	2921-88-2	mg/kg							< 0.033 U		< 0.033 U	< 0.033 U	
Coumaphos	56-72-4	mg/kg							< 0.167 U		< 0.167 U	< 0.167 U	
delta-BHC	319-86-8	mg/kg	< 0.85 U		< 0.21 U	< 0.21 U	< 0.21 U		< 0.85 U		< 0.21 U	< 0.85 U	
delta-BHC	319-86-8	mg/kg	< 0.21 U		< 0.85 U	< 0.85 U	< 0.85 U		< 0.21 U		< 0.85 U	< 0.21 U	
Demeton-S	126-75-0	mg/kg							< 0.033 U		< 0.033 U	< 0.033 U	
Diazinon	333-41-5	mg/kg							< 0.033 U		< 0.033 U	< 0.033 U	
Dieldrin	60-57-1	mg/kg	< 0.079 U		< 0.16 U	< 0.16 U	< 0.079 U		< 0.079 U		< 0.079 U	< 0.079 U	
Dieldrin	60-57-1	mg/kg	< 0.16 U		< 0.079 U	< 0.079 U	< 0.16 U		0.25 N		< 0.16 U	0.5 N	
Disulfoton	298-04-4	mg/kg							< 0.017 U		< 0.017 U	< 0.017 U	
Endosulfan I	959-98-8	mg/kg	< 0.4 U		< 0.4 U	< 0.4 U	< 0.4 U		< 0.4 U		< 0.4 U	< 0.1 U	
Endosulfan I	959-98-8	mg/kg	0.27 N		< 0.1 U	< 0.1 U	< 0.1 U		< 0.1 U		< 0.1 U	< 0.4 U	
Endosulfan II	33213-65-9	mg/kg	< 0.07 U		< 2.4 U	< 2.4 U	< 2.4 U		< 2.4 U		< 2.4 U	< 2.4 U	
Endosulfan II	33213-65-9	mg/kg	< 2.4 U		< 0.07 U	< 0.07 U	< 0.07 U		< 0.07 U		< 0.07 U	< 0.07 U	
Endosulfan sulfate	1031-07-8	mg/kg	< 0.05 UT		< 0.05 UT	< 0.05 UT	< 1.2 U		0.03 N		< 1.2 U	< 1.2 U	
Endosulfan sulfate	1031-07-8	mg/kg	< 1.2 U		< 1.2 U	< 1.2 U	< 0.05 UT		< 1.2 U		< 0.05 UT	< 0.05 UT	
Endrin	72-20-8	mg/kg	< 0.65 U		< 1.3 U	< 0.65 U	< 0.65 U		< 0.65 U		< 0.65 U	< 1.3 U	
Endrin	72-20-8	mg/kg	< 1.3 U		< 0.65 U	< 1.3 U	< 1.3 U		< 1.3 U		< 1.3 U	< 0.12 ND	
Endrin aldehyde	7421-93-4	mg/kg	< 1.8 U		< 1.8 U	< 1.8 U	< 1.8 U		< 1.8 U		< 1.8 U	< 1.8 U	
Endrin ketone	53494-70-5	mg/kg	< 0.05 UT		< 0.05 UT	< 0.05 UT	< 0.05 UT		< 0.05 UT		< 0.05 UT	< 0.05 UT	
Ethoprop	13194-48-4	mg/kg							< 0.333 U		< 0.333 U	< 0.333 U	
Fenchlorphos	299-84-3	mg/kg							< 0.033 U		< 0.033 U	< 0.033 U	
Fensulfothion	115-90-2	mg/kg							< 0.167 U		< 0.167 U	< 0.167 U	
Fenthion	55-38-9	mg/kg							< 0.067 U		< 0.067 U	< 0.067 U	
gamma-BHC (Lindane)	58-89-9	mg/kg	< 0.1 U		< 0.1 U	< 0.1 UJ	< 0.1 UJ		0.01 N		< 0.1 U	< 0.1 U	
gamma-BHC (Lindane)	58-89-9	mg/kg	< 0.1 UJ		< 0.1 UJ	< 0.1 U	< 0.1 U		< 0.1 U		< 0.1 U	< 0.1 U	
Heptachlor	76-44-8	mg/kg	< 0.22 U		< 0.24 U	< 0.24 U	< 0.24 U		< 0.24 U		< 0.22 U	< 0.22 U	
Heptachlor	76-44-8	mg/kg	< 0.24 U		< 0.22 U	< 0.22 U	< 0.22 U		< 0.22 U		< 0.24 U	< 0.24 U	
Heptachlor epoxide	1024-57-3	mg/kg	< 0.48 U		< 0.48 U	< 0.48 U	< 0.48 U		0.77		< 0.48 U	0.53	
Heptachlor epoxide	1024-57-3	mg/kg	< 0.13 U		< 0.13 U	< 0.13 U	< 0.13 U		< 0.48 U		0.34	< 0.48 U	
Isodrin	465-73-6	mg/kg	< 0.3 U		< 0.3 U	< 0.48 U	< 0.48 U		< 0.48 U		< 0.3 U	< 0.3 U	
Isodrin	465-73-6	mg/kg	< 0.48 U		< 0.48 U	< 0.3 U	< 0.3 U		< 0.3 U		< 0.48 U	< 0.48 U	
Malathion	121-75-5	mg/kg	< 0.18 U		< 0.18 U	< 0.18 U	< 0.18 U		< 0.18 U		< 0.18 U	< 0.18 U	
Methoxychlor	72-43-5	mg/kg	< 0.26 U		< 0.0359 U	< 0.26 U	< 0.26 U		< 0.0359 U		< 0.0359 U	< 0.26 U	
Methoxychlor	72-43-5	mg/kg	< 0.0359 U		< 0.26 U	< 0.0359 U	< 0.0359 U		< 0.26 U		< 0.26 U	< 0.0359 U	
Methyl parathion	298-00-0	mg/kg							< 0.017 U		< 0.017 U	< 0.017 U	
Mevinphos	7786-34-7	mg/kg							< 0.067 U		< 0.067 U	< 0.067 U	
Mirex	2385-85-5	mg/kg	< 0.14 U		< 0.14 U	< 0.14 U	< 0.14 U		< 0.14 U		< 0.14 U	< 0.14 U	
Naled	300-76-5	mg/kg							< 0.033 U		< 0.033 U	< 0.033 U	
Parathion	56-38-2	mg/kg	< 1.7 U		< 1.7 U	< 1.7 U	< 1.7 U		< 1.7 U		< 1.7 U	< 1.7 U	
p-Chlorophenylmethyl sulfide	123-09-1	mg/kg	< 0.097 U		< 0.097 U	< 0.097 U	< 0.097 U		< 0.097 U		< 0.097 U	< 0.097 U	
p-Chlorophenylmethyl sulfone	98-57-7	mg/kg	< 0.066 U		< 0.066 U	< 0.066 U	< 0.066 U		< 0.066 U		< 0.066 U	< 0.066 U	
p-Chlorophenylmethyl sulfoxide	934-73-6	mg/kg	< 0.32 U		< 0.32 U	< 0.32 U	< 0.32 U		< 0.32 U		< 0.32 U	< 0.32 U	

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Site Name / Location ID / Sample Date / Depth Interval / Sample ID / Sample Matrix / Unit	118 D-SB118-1 11/2/1993 0 - 2 SB118-1A(0-2) SO	118 D-SB118-1 11/2/1993 0 - 2 SB118-1B(0-2) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1C(2-4) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1CD(2-4) SO	118 D-SB118-1 11/2/1993 4 - 6 SB118-1D(4-6) SO	118 D-SS118-1 10/20/1993 .5 - 1 SS118-1B(0.5-1) SO	118 D-SS118-1 10/20/1993 0 - .5 SS118-1A(0-0.5) SO	118 D-SS118-2 10/20/1993 .5 - 1 SS118-2B(0.5-1) SO	118 D-SS118-2 10/20/1993 0 - .5 SS118-2A(0-0.5) SO	118 D-SS118-3 10/20/1993 0 - .5 SS118-3A(0-0.5) SO	118 D-SS118-3 10/20/1993 .5 - 1 SS118-3B(0.5-1) SO
Phorate	298-02-2	mg/kg							< 0.017 U		< 0.017 U	< 0.017 U	
Prothiophos	24643-46-4	mg/kg							< 0.067 U		< 0.067 U	< 0.067 U	
Stirophos	961-11-5	mg/kg							< 0.033 U		< 0.033 U	< 0.033 U	
Supona	470-90-6	mg/kg	< 0.92 U		< 0.92 U	< 0.92 U	< 0.92 U		< 0.92 U		< 0.92 U	< 0.92 U	
Toxaphene	8001-35-2	mg/kg	< 0.226 U		< 12 U	< 12 U	< 12 U		< 12 U		< 12 U	< 0.226 U	
Toxaphene	8001-35-2	mg/kg	< 12 U		< 0.226 U	< 0.226 U	< 0.226 U		< 0.226 U		< 0.226 U	< 12 U	
Vapona	62-73-7	mg/kg	< 0.068 U		< 0.068 U	< 0.068 U	< 0.068 U		< 0.017 U		< 0.017 U	< 0.068 U	
Vapona	62-73-7	mg/kg							< 0.068 U		< 0.068 U	< 0.017 U	
SVOC													
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg		< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U		< 0.2 U			< 0.2 U
1,2,4-Trichlorobenzene	120-82-1	mg/kg	< 0.22 U		< 0.22 U	< 0.22 U	< 0.22 U		< 0.22 U		< 0.22 U	< 0.22 U	
1,2-Dichlorobenzene	95-50-1	mg/kg	< 0.042 U		< 0.042 U	< 0.042 U	< 0.042 U		< 0.042 U		< 0.042 U	< 0.042 U	
1,2-Diphenylhydrazine	122-66-7	mg/kg	< 0.52 U		< 0.52 U	< 0.52 U	< 0.52 U		< 0.52 U		< 0.52 U	< 0.52 U	
1,3-Dichlorobenzene	541-73-1	mg/kg	< 0.042 U	< 0.14 U	< 0.042 U	< 0.14 U	< 0.042 U	< 0.14 U	< 0.042 U	< 0.14 U	< 0.042 U	< 0.042 U	< 0.14 U
1,3-Dichlorobenzene	541-73-1	mg/kg			< 0.14 U	< 0.042 U	< 0.14 U						
1,4-Dichlorobenzene	106-46-7	mg/kg	< 0.034 U		< 0.034 U	< 0.034 U	< 0.034 U		< 0.034 U		< 0.034 U	< 0.034 U	
2,4,5-Trichlorophenol	95-95-4	mg/kg	< 0.49 U		< 0.49 U	< 0.49 U	< 0.49 U		< 0.49 U		< 0.49 U	< 0.49 U	
2,4,6-Trichlorophenol	88-06-2	mg/kg	< 0.061 U		< 0.061 U	< 0.061 U	< 0.061 U		< 0.061 U		< 0.061 U	< 0.061 U	
2,4-Dichlorophenol	120-83-2	mg/kg	< 0.065 U		< 0.065 U	< 0.065 U	< 0.065 U		< 0.065 U		< 0.065 U	< 0.065 U	
2,4-Dimethylphenol	105-67-9	mg/kg	< 3 U		< 3 U	< 3 U	< 3 U		< 3 U		< 3 U	< 3 U	
2,4-Dinitrophenol	51-28-5	mg/kg	< 4.7 U		< 4.7 U	< 4.7 U	< 4.7 U		< 4.7 U		< 4.7 U	< 4.7 U	
2,6-Dinitroaniline	606-22-4	mg/kg	< 0.57 U		< 0.57 U	< 0.57 U	< 0.57 U		< 0.57 U		< 0.57 U	< 0.57 U	
2-Chloronaphthalene	91-58-7	mg/kg	< 0.24 U		< 0.24 U	< 0.24 U	< 0.24 U		< 0.24 U		< 0.24 U	< 0.24 U	
2-Chlorophenol	95-57-8	mg/kg	< 0.055 U		< 0.055 U	< 0.055 U	< 0.055 U		< 0.055 U		< 0.055 U	< 0.055 U	
2-Methylnaphthalene	91-57-6	mg/kg	< 0.032 U		< 0.032 U	< 0.032 U	< 0.032 U		0.2		< 0.032 U	< 0.032 U	
2-Methylphenol	95-48-7	mg/kg	< 0.098 U		< 0.098 U	< 0.098 U	< 0.098 U		< 0.098 U		< 0.098 U	< 0.098 U	
2-Nitrophenol	88-75-5	mg/kg	< 1.1 U		< 1.1 U	< 1.1 U	< 1.1 U		< 1.1 U		< 1.1 U	< 1.1 U	
3,3'-Dichlorobenzidine	91-94-1	mg/kg	< 1.6 U		< 1.6 U	< 1.6 U	< 1.6 U		< 1.6 U		< 1.6 U	< 1.6 U	
3,5-Dinitroaniline	618-87-1	mg/kg	< 1.6 U		< 1.6 U	< 1.6 U	< 1.6 U		< 1.6 U		< 1.6 U	< 1.6 U	
3-Nitroaniline	99-09-2	mg/kg	< 3 U		< 3 U	< 3 U	< 3 U		< 3 U		< 3 U	< 3 U	
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg	< 0.8 U		< 0.8 U	< 0.8 U	< 0.8 U		< 0.8 U		< 0.8 U	< 0.8 U	
4-Bromophenyl phenyl ether	101-55-3	mg/kg	< 0.041 U		< 0.041 U	< 0.041 U	< 0.041 U		< 0.041 U		< 0.041 U	< 0.041 U	
4-Chloro-3-methylphenol	59-50-7	mg/kg	< 0.93 U		< 0.93 U	< 0.93 U	< 0.93 U		< 0.93 U		< 0.93 U	< 0.93 U	
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	< 0.17 U		< 0.17 U	< 0.17 U	< 0.17 U		< 0.17 U		< 0.17 U	< 0.17 U	
4-Methylphenol	106-44-5	mg/kg	< 0.24 U#		< 0.24 U#	< 0.24 U#	< 0.24 U#		< 0.24 U#		< 0.24 U#	< 0.24 U#	
4-Nitrophenol	100-02-7	mg/kg	< 3.3 U		< 3.3 U	< 3.3 U	< 3.3 U		< 3.3 U		< 3.3 U	< 3.3 U	
Acenaphthene	83-32-9	mg/kg	< 0.041 U		< 0.041 U	< 0.041 U	< 0.041 U		< 0.041 U		< 0.041 U	< 0.041 U	
Acenaphthylene	208-96-8	mg/kg	< 0.033 U		< 0.033 U	< 0.033 U	< 0.033 U		< 0.033 U		< 0.033 U	< 0.033 U	
Anthracene	120-12-7	mg/kg	< 0.71 U		< 0.71 U	< 0.71 U	< 0.71 U		< 0.71 U		< 0.71 U	< 0.71 U	
Benz(a)anthracene	56-55-3	mg/kg							< 0.041 U		< 0.041 U	< 0.041 U	
Benzo(a)pyrene	50-32-8	mg/kg	< 1.2 U		< 1.2 U	< 1.2 U	< 1.2 U		< 1.2 U		< 1.2 U	< 1.2 U	
Benzo(b)fluoranthene	205-99-2	mg/kg	< 0.31 U		< 0.31 U	< 0.31 U	< 0.31 U		< 0.31 U		< 0.31 U	< 0.31 U	
Benzo(g,h,i)perylene	191-24-2	mg/kg	< 0.18 U		< 0.18 U	< 0.18 U	< 0.18 U		< 0.18 U		< 0.18 U	< 0.18 U	
Benzo(k)fluoranthene	207-08-9	mg/kg	< 0.13 U		< 0.13 U	< 0.13 U	< 0.13 U		< 0.13 U		< 0.13 U	< 0.13 U	
Benzyl alcohol	100-51-6	mg/kg	< 0.032 U		< 0.032 U	< 0.032 U	< 0.032 U		< 0.032 U		< 0.032 U	< 0.032 U	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg	< 0.19 U		< 0.19 U	< 0.19 U	< 0.19 U		< 0.19 U		< 0.19 U	< 0.19 U	
bis(2-Chloroethyl)ether	111-44-4	mg/kg	< 0.36 U		< 0.36 U	< 0.36 U	< 0.36 U		< 0.36 U		< 0.36 U	< 0.36 U	
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg	< 0.44 U		< 0.44 U	< 0.44 U	< 0.44 U		< 0.44 U		< 0.44 U	< 0.44 U	
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	< 0.48 U		< 0.48 U	< 0.48 U	< 0.48 U		< 0.48 U		< 0.48 U	< 0.48 U	
Butylbenzyl phthalate	85-68-7	mg/kg	< 1.8 U		< 1.8 U	< 1.8 U	< 1.8 U		< 1.8 U		< 1.8 U	< 1.8 U	
Chrysene	218-01-9	mg/kg	< 0.032 U		< 0.032 U	< 0.032 U	< 0.032 U		< 0.032 U		< 0.032 U	< 0.032 U	
Dibenz(a,h)anthracene	53-70-3	mg/kg	< 0.31 U		< 0.31 U	< 0.31 U	< 0.31 U		< 0.31 U		< 0.31 U	< 0.31 U	
Dibenzofuran	132-64-9	mg/kg	< 0.38 U		< 0.38 U	< 0.38 U	< 0.38 U		< 0.038 U		< 0.038 U	< 0.038 U	
Dichlorobenzenes	25321-22-6	mg/kg		< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U		< 0.2 U			< 0.2 U
Dicyclopentadiene	77-73-6	mg/kg	< 0.57 U		< 0.57 U	< 0.57 U	< 0.57 U		< 0.57 U		< 0.57 U	< 0.57 U	
Diethylphthalate	84-66-2	mg/kg	< 0.24 U		< 0.24 U	< 0.24 U	< 0.24 U		< 0.24 U		< 0.24 U	< 0.24 U	
Dimethylphthalate	131-11-3	mg/kg	< 0.063 U		< 0.063 U	< 0.063 U	< 0.063 U		< 0.063 U		< 0.063 U	< 0.063 U	
di-n-Butylphthalate	84-74-2	mg/kg	1.7		1.7	< 1.3 U	< 1.3 U		< 1.3 U		< 1.3 U	1.8	
di-n-Octylphthalate	117-84-0	mg/kg	< 0.23 U		< 0.23 U	< 0.23 U	< 0.23 U		< 0.23 U		< 0.23 U	< 0.23 U	
Fluoranthene	206-44-0	mg/kg	< 0.032 U		< 0.032 U	< 0.032 U	< 0.032 U		0.11		< 0.032 U	0.12	

Table B-1
Historical Analytical Results for Soil at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Site Name / Location ID / Sample Date / Depth Interval / Sample ID / Sample Matrix / Unit	118 D-SB118-1 11/2/1993 0 - 2 SB118-1A(0-2) SO	118 D-SB118-1 11/2/1993 0 - 2 SB118-1B(0-2) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1C(2-4) SO	118 D-SB118-1 11/2/1993 2 - 4 SB118-1CD(2-4) SO	118 D-SB118-1 11/2/1993 4 - 6 SB118-1D(4-6) SO	118 D-SS118-1 10/20/1993 .5 - 1 SS118-1B(0.5-1) SO	118 D-SS118-1 10/20/1993 0 - .5 SS118-1A(0-0.5) SO	118 D-SS118-2 10/20/1993 .5 - 1 SS118-2B(0.5-1) SO	118 D-SS118-2 10/20/1993 0 - .5 SS118-2A(0-0.5) SO	118 D-SS118-3 10/20/1993 0 - .5 SS118-3A(0-0.5) SO	118 D-SS118-3 10/20/1993 .5 - 1 SS118-3B(0.5-1) SO
Fluorene	86-73-7	mg/kg	< 0.065 U		< 0.065 U	< 0.065 U	< 0.065 U		< 0.065 U		< 0.065 U	< 0.065 U	
Hexachlorobenzene	118-74-1	mg/kg	< 0.08 U		< 0.08 U	< 0.08 U	< 0.08 U		< 0.08 U		< 0.08 U	< 0.08 U	
Hexachlorobutadiene	87-68-3	mg/kg	< 0.97 U		< 0.97 U	< 0.97 U	< 0.97 U		< 0.97 U		< 0.97 U	< 0.97 U	
Hexachlorocyclopentadiene	77-47-4	mg/kg	< 0.52 U		< 0.52 U	< 0.52 U	< 0.52 U		< 0.52 U		< 0.52 U	< 0.52 U	
Hexachloroethane	67-72-1	mg/kg	< 1.8 U		< 1.8 U	< 1.8 U	< 1.8 U		< 1.8 U		< 1.8 U	< 1.8 U	
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	< 2.4 U		< 2.4 U	< 2.4 U	< 2.4 U		< 2.4 U		< 2.4 U	< 2.4 U	
Isophorone	78-59-1	mg/kg	< 0.39 U		< 0.39 U	< 0.39 U	< 0.39 U		< 0.39 U		< 0.39 U	< 0.39 U	
Naphthalene	91-20-3	mg/kg	< 0.74 U		< 0.74 U	< 0.74 U	< 0.74 U		< 0.74 U		< 0.74 U	< 0.74 U	
N-Nitrosodimethylamine	62-75-9	mg/kg	< 0.46 U		< 0.46 U	< 0.46 U	< 0.46 U		< 0.46 U		< 0.46 U	< 0.46 U	
n-Nitroso-di-n-propylamine	621-64-7	mg/kg	< 1.1 U		< 1.1 U	< 1.1 U	< 1.1 U		< 1.1 U		< 1.1 U	< 1.1 U	
n-Nitrosodiphenylamine	86-30-6	mg/kg	< 0.29 U		< 0.29 U	< 0.29 U	< 0.29 U		< 0.29 U		< 0.29 U	< 0.29 U	
Pentachlorophenol	87-86-5	mg/kg	< 0.76 U		< 0.76 U	< 0.76 U	< 0.76 U		< 0.76 U		< 0.76 U	< 0.76 U	
Phenanthrene	85-01-8	mg/kg	< 0.032 U		< 0.032 U	< 0.032 U	< 0.032 U		0.32		< 0.032 U	< 0.032 U	
Phenol	108-95-2	mg/kg	< 0.052 U		< 0.052 U	< 0.052 U	< 0.052 U		< 0.052 U		< 0.052 U	< 0.052 U	
Pyrene	129-00-0	mg/kg	< 0.083 U		< 0.083 U	< 0.083 U	< 0.083 U		< 0.083 U		< 0.083 U	< 0.083 U	
VOC													
1,1,1-Trichloroethane	71-55-6	mg/kg		< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U		< 0.2 U			< 0.2 U
1,1,2-Trichloroethane	79-00-5	mg/kg		< 0.33 U	< 0.33 U	< 0.33 U	< 0.33 U	< 0.33 U		< 0.33 U			< 0.33 U
1,1-Dichloroethane	75-34-3	mg/kg		< 0.49 U	< 0.49 U	< 0.49 U	< 0.49 U	< 0.49 U		< 0.49 U			< 0.49 U
1,1-Dichloroethene	75-35-4	mg/kg		< 0.27 U	< 0.27 U	< 0.27 U	< 0.27 U	< 0.27 U		< 0.27 U			< 0.27 U
1,2,3-Trichlorobenzene	87-61-6	mg/kg	< 0.032 U		< 0.032 U	< 0.032 U	< 0.032 U		< 0.032 U		< 0.032 U	< 0.032 U	
1,2-Dichloroethane	107-06-2	mg/kg		< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U		< 0.32 U			< 0.32 U
1,2-Dichloroethene (total)	540-59-0	mg/kg		< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U		< 0.32 U			< 0.32 U
1,2-Dichloropropane	78-87-5	mg/kg		< 0.53 U	< 0.53 U	< 0.53 U	< 0.53 U	< 0.53 U		< 0.53 U			< 0.53 U
1,3-Dichloropropane	142-28-9	mg/kg		< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U		< 0.2 U			< 0.2 U
2,3,6-Trichlorophenol	933-75-5	mg/kg	< 0.62 U		< 0.62 U	< 0.62 U	< 0.62 U		< 0.62 U		< 0.62 U	< 0.62 U	
2-Butanone	78-93-3	mg/kg		< 4.3 U	< 4.3 U	< 4.3 U	< 4.3 U	< 4.3 U		< 4.3 U			< 4.3 U
2-Chloroethyl vinyl ether	110-75-8	mg/kg		< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U		< 0.5 U			< 0.5 U
4-Methyl-2-pentanone (MIBK)	108-10-1	mg/kg		< 0.63 U	< 0.63 U	< 0.63 U	< 0.63 U	< 0.63 U		< 0.63 U			< 0.63 U
Acetone	67-64-1	mg/kg		< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U		< 3.3 U			< 3.3 U
Acrylonitrile	107-13-1	mg/kg		< 2 U	< 2 U	< 2 U	< 2 U	< 2 U		< 2 U			< 2 U
Benzene	71-43-2	mg/kg		< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U		< 0.1 U			< 0.1 U
Bromodichloromethane	75-27-4	mg/kg		< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U		< 0.2 U			< 0.2 U
Bromoform	75-25-2	mg/kg		< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U		< 0.2 U			< 0.2 U
Bromomethane	74-83-9	mg/kg		< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U		< 0.26 U			< 0.26 U
Carbon tetrachloride	56-23-5	mg/kg		< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U		< 0.31 U			< 0.31 U
Chlorobenzene	108-90-7	mg/kg		< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U		< 0.1 U			< 0.1 U
Chloroethane	75-00-3	mg/kg		< 0.64 U	< 0.64 U	< 0.64 U	< 0.64 U	< 0.64 U		< 0.64 U			< 0.64 U
Chloroform	67-66-3	mg/kg		< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U		< 0.24 U			< 0.24 U
Chloromethane	74-87-3	mg/kg		< 0.96 U	< 0.96 U	< 0.96 U	< 0.96 U	< 0.96 U		< 0.96 U			< 0.96 U
Dibromochloromethane	124-48-1	mg/kg		< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U		< 0.25 U			< 0.25 U
Dibromochloropropane	96-12-8	mg/kg	< 0.071 U		< 0.071 U	< 0.071 U	< 0.071 U		< 0.071 U		< 0.071 U	< 0.071 U	
Ethyl benzene	100-41-4	mg/kg		< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U		< 0.19 U			< 0.19 U
Methylene chloride	75-09-2	mg/kg		< 4.4 U	< 4.4 U	< 4.4 U	< 4.4 U	< 4.4 U		< 4.4 U			< 4.4 U
m-Xylenes	108-38-3	mg/kg		< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U		< 0.23 U			< 0.23 U
Tetrachloroethene	127-18-4	mg/kg		< 0.16 U	< 0.16 U	< 0.16 U	< 0.16 U	< 0.16 U		< 0.16 U			< 0.16 U
Toluene	108-88-3	mg/kg		< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U		< 0.1 U			< 0.1 U
Trichloroethene	79-01-6	mg/kg		< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U		< 0.23 U			< 0.23 U
Trichlorofluoromethane	75-69-4	mg/kg		< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U		< 0.23 U			< 0.23 U
Vinyl chloride	75-01-4	mg/kg		< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U		< 1.8 U			< 1.8 U
Xylenes	1330-20-7	mg/kg		< 0.78 U	< 0.78 U	< 0.78 U	< 0.78 U	< 0.78 U		< 0.78 U			< 0.78 U
WetChem													
% Solids	%Solid	%											
Cyanide	57-12-5	mg/kg	2.84 J		0.79 J	0.41 J	0.47 J		0.41		< 0.25 U	13 D	

Table B-2
Historical Analytical Results for Sediment at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118
		Location ID	D-B-SB-SD-44	D-B-SB-SD-45	D-SDBS-25	D-SDBS-25
		Sample Date	3/11/1999	3/11/1999	10/26/1993	8/13/2007
		Depth Interval	0 - 1	0 - 1	0 - .5	0 - .5
		Sample ID	BSBSD-44(0-1)	BSBSD-45(0-1)	SDBS-25(0-0.5)	D-SDBS025(0-0.5)
		Sample Matrix	SE	SE	SE	SE
Chemical Name	CAS No	Unit				
Dioxins						
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	mg/kg	0.11	0.27 J	< 0.0115 U	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	mg/kg	< 0.0621 U	< 0.238 U	< 0.435 U	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	mg/kg	< 0.0527 U	< 0.207 U	< 0.451 U	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	mg/kg	< 0.0546 U	< 0.217 U	< 0.431 U	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	mg/kg	< 0.0433 U	< 0.176 U	< 0.409 U	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	mg/kg	< 0.0527 U	< 0.211 U	< 0.312 U	
Octachlorodibenzodioxin	3268-87-9	mg/kg	0.24	0.01	0.05	
Total heptachlorodibenzo-p-dioxins	37871-00-4	mg/kg	0.11	0.49 J		
Total hexachlorodibenzo-p-dioxins	34465-46-8	mg/kg	< 0.0565 U	< 0.22 U		
Total pentachlorodibenzo-p-dioxins	36088-22-9	mg/kg	< 0.188 U	0.12 J		
Total tetrachlorodibenzo-p-dioxins	41903-57-5	mg/kg	< 0.0527 U	< 0.211 U		
Explosives						
1,3,5-Trinitrobenzene	99-35-4	mg/kg			< 0.922 U	
1,3-Dinitrobenzene	99-65-0	mg/kg			< 0.504 U	
2,4,6-Trinitrotoluene	118-96-7	mg/kg			< 2 U	
3-Nitrotoluene	99-08-1	mg/kg			< 0.34 U	
HMX	2691-41-0	mg/kg			< 2 U	
Nitrobenzene	98-95-3	mg/kg			< 1.14 U	
Nitrobenzene	98-95-3	mg/kg			< 1.8 U	
Nitrocellulose	9004-70-0	mg/kg			56.6	
Nitroglycerin	55-63-0	mg/kg			< 0.51 U	
PETN	78-11-5	mg/kg			< 1 U	
RDX	121-82-4	mg/kg			< 1.28 U	
Tetryl	479-45-8	mg/kg			< 2.11 U	
Explosives / SVOC						
2,4-Dinitrotoluene	121-14-2	mg/kg			< 1.4 U	
2,4-Dinitrotoluene	121-14-2	mg/kg			< 2.5 U	
2,6-Dinitrotoluene	606-20-2	mg/kg			< 0.32 U	
2,6-Dinitrotoluene	606-20-2	mg/kg			< 2 U	
Furans						
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	mg/kg	< 0.107 U	< 0.372 U	< 0.308 U	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	mg/kg	< 0.121 U	< 0.402 U	< 0.402 U	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	mg/kg	< 0.0508 U	< 0.22 U	< 0.291 U	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	mg/kg	< 0.0452 U	< 0.198 U	< 0.279 U	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	mg/kg	< 0.0546 U	< 0.241 U	< 0.364 U	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	mg/kg	< 0.0678 U	< 0.232 U	< 0.285 U	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	mg/kg	< 0.0508 U	< 0.223 U	< 0.303 U	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	mg/kg	< 0.064 U	< 0.226 U	< 0.274 U	
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	mg/kg	< 0.0339 U	< 0.142 U	< 0.275 U	
Octachlorodibenzofuran	39001-02-0	mg/kg	< 0.179 U	0.19 J	< 0.627 U	
Total heptachlorodibenzofurans	38998-75-3	mg/kg	0.03 J	0.12 J		
Total hexachlorodibenzofurans	55684-94-1	mg/kg	< 0.0508 U	< 0.22 U		
Total pentachlorodibenzofurans	30402-15-4	mg/kg	< 0.0659 U	< 0.619 U		
Total tetrachlorodibenzofurans	30402-14-3	mg/kg	< 0.0339 U	< 0.142 U		
Metals						
Aluminum	7429-90-5	mg/kg	10500 J	12700 J	10500	1750
Antimony	7440-36-0	mg/kg	0.94 J	1.21 J	< 1 U	< 0.12 U
Arsenic	7440-38-2	mg/kg	3.01	25.1	4.59	1.31
Barium	7440-39-3	mg/kg	87.9	212	101	8.97
Beryllium	7440-41-7	mg/kg	< 0.942 U	0.68 J	1.14	0.0942 J
Boron	7440-42-8	mg/kg	< 37.7 U	< 61.9 U		
Cadmium	7440-43-9	mg/kg	29.8 J	1180 J	16.2	1.07
Calcium	7440-70-2	mg/kg	11900	5080	15300	584
Chromium	7440-47-3	mg/kg	118 J	5390 J	100	21.6
Cobalt	7440-48-4	mg/kg	19.8	23.2	8.7	1.56
Copper	7440-50-8	mg/kg	150 J	1850 J	83.1	8.46
Iron	7439-89-6	mg/kg	21700 J	35300 J	17700	4340
Lead	7439-92-1	mg/kg	58.6 J	656 J	43	4.4
Magnesium	7439-95-4	mg/kg	7310	3500	5930	785
Manganese	7439-96-5	mg/kg	211 J	216 J	913	52.9
Mercury	7439-97-6	mg/kg	0.49 J	10.2 DJ	0.14	0.0236 J
Nickel	7440-02-0	mg/kg	33	189	24.6	3.61
Potassium	7440-09-7	mg/kg	465 J	1240 J	847	145
Selenium	7782-49-2	mg/kg	< 0.942 U	< 1.55 U	< 0.449 U	0.217 J
Silver	7440-22-4	mg/kg	7.53	147	13.7	0.503 J
Sodium	7440-23-5	mg/kg	209 J	285 J	321	28.2
Thallium	7440-28-0	mg/kg	< 1.88 U	< 3.1 U	< 34.3 U	0.0208 J
Titanium	7440-32-6	mg/kg	1230 J	523 J		
Vanadium	7440-62-2	mg/kg	40.3 J	40.9 J	25.5	3.23
Zinc	7440-66-6	mg/kg	360 J	4370 J	252	33.8

Table B-2
Historical Analytical Results for Sediment at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118
		Location ID	D-B-SB-SD-44	D-B-SB-SD-45	D-SDBS-25	D-SDBS-25
		Sample Date	3/11/1999	3/11/1999	10/26/1993	8/13/2007
		Depth Interval	0 - 1	0 - 1	0 - .5	0 - .5
		Sample ID	BSBSD-44(0-1)	BSBSD-45(0-1)	SDBS-25(0-0.5)	D-SDBS025(0-0.5)
		Sample Matrix	SE	SE	SE	SE
Chemical Name	CAS No	Unit				
Other						
1,4-Oxathiane	15980-15-1	mg/kg			< 0.075 U	
Dithiane	51330-42-8	mg/kg			< 0.065 U	
PCBs						
Aroclor 1016	12674-11-2	mg/kg	< 0.0621 U	< 2.04 UD	< 0.1 U	
Aroclor 1016	12674-11-2	mg/kg			< 0.32 U	
Aroclor 1016	12674-11-2	ug/kg				< 19.5 U
Aroclor 1221	11104-28-2	mg/kg	< 0.0621 U	< 2.04 UD	< 0.1 UT	
Aroclor 1221	11104-28-2	ug/kg				< 19.5 U
Aroclor 1232	11141-16-5	ug/kg				< 19.5 U
Aroclor 1232	11141-16-5	mg/kg	< 0.0621 U	< 2.04 UD	< 0.1 UT	
Aroclor 1242	53469-21-9	mg/kg	< 0.0621 U	< 2.04 UD	< 0.1 UT	
Aroclor 1242	53469-21-9	ug/kg				< 19.5 U
Aroclor 1248	12672-29-6	mg/kg	0.18	8.05 D	< 0.1 UT	
Aroclor 1248	12672-29-6	ug/kg				< 19.5 U
Aroclor 1254	11097-69-1	mg/kg	0.3	12.1 D	0.08 N	
Aroclor 1254	11097-69-1	ug/kg				33.8
Aroclor 1260	11096-82-5	mg/kg	< 0.0621 U	< 2.04 UD	< 0.0479 U	
Aroclor 1260	11096-82-5	mg/kg			< 0.79 U	
Aroclor 1260	11096-82-5	ug/kg				23.2
Aroclor 1262	37324-23-5	mg/kg			< 6.3 U	
Pesticides						
4,4'-DDD	72-54-8	mg/kg	0.03 NJ	0.17 DNJ	< 0.064 U	
4,4'-DDD	72-54-8	mg/kg			< 0.27 U	
4,4'-DDD	72-54-8	ug/kg				< 1.95 U
4,4'-DDE	72-55-9	mg/kg	< 0.32 U	0.4 DNJ	< 0.27 U	
4,4'-DDE	72-55-9	mg/kg			< 0.068 U	
4,4'-DDT	50-29-3	mg/kg	< 0.16 UD	< 0.263 UD	< 0.1 U	
4,4'-DDT	50-29-3	mg/kg			0.76	
Aldrin	309-00-2	mg/kg	< 0.32 U	< 0.0526 UD	< 1.3 U	
Aldrin	309-00-2	mg/kg			< 0.14 U	
Aldrin	309-00-2	ug/kg				< 1.95 U
alpha-BHC	319-84-6	mg/kg	< 0.32 U	< 0.0526 UD	< 1.3 U	
alpha-BHC	319-84-6	mg/kg			< 0.28 U	
alpha-BHC	319-84-6	ug/kg				< 1.95 U
alpha-Chlordane	5103-71-9	mg/kg	0.18 NJ	0.02 DNJ		
alpha-Chlordane	5103-71-9	ug/kg				< 1.95 U
Atrazine	1912-24-9	mg/kg			< 0.065 U	
beta-BHC	319-85-7	mg/kg	0.16 NJ	< 0.0526 UD	< 1.3 U	
beta-BHC	319-85-7	mg/kg			< 0.77 U	
beta-BHC	319-85-7	ug/kg				< 1.95 U
Chlordane	57-74-9	mg/kg			< 0.68 U	
Chlordane	57-74-9	mg/kg			< 0.0684 UJ	
delta-BHC	319-86-8	mg/kg	< 0.32 U	< 0.0526 UD	< 0.21 U	
delta-BHC	319-86-8	mg/kg			< 0.85 U	
delta-BHC	319-86-8	ug/kg				< 1.95 U
Diazinon	333-41-5	mg/kg	< 6.21 UD	< 10.2 UD		
Dieldrin	60-57-1	ug/kg				< 1.95 U
Dieldrin	60-57-1	mg/kg	0.45 NJ	0.13 DNJ	< 0.16 U	
Dieldrin	60-57-1	mg/kg			< 0.079 U	
Endosulfan I	959-98-8	mg/kg	< 0.32 U	< 0.0526 UD	< 0.1 U	
Endosulfan I	959-98-8	mg/kg			< 0.4 U	
Endosulfan I	959-98-8	ug/kg				< 1.95 U
Endosulfan II	33213-65-9	mg/kg	< 0.32 UJ	< 0.0526 UJD	< 2.4 U	
Endosulfan II	33213-65-9	mg/kg			< 0.07 U	
Endosulfan II	33213-65-9	ug/kg				< 1.95 U
Endosulfan sulfate	1031-07-8	mg/kg	< 0.32 U	< 0.0526 UD	< 1.2 U	
Endosulfan sulfate	1031-07-8	mg/kg			< 0.05 UT	
Endosulfan sulfate	1031-07-8	ug/kg				< 1.95 U
Endrin	72-20-8	mg/kg	< 0.32 U	< 0.0526 UD	< 1.3 U	
Endrin	72-20-8	mg/kg			< 0.65 UJ	
Endrin	72-20-8	ug/kg				< 1.95 U
Endrin aldehyde	7421-93-4	mg/kg	0.01 NJ	0.09 DNJ	< 1.8 U	
Endrin aldehyde	7421-93-4	ug/kg				< 1.95 U
Endrin ketone	53494-70-5	mg/kg	0.49 NJ	< 0.0526 UJD	< 0.05 UT	
Endrin ketone	53494-70-5	ug/kg				< 1.95 U
gamma-BHC (Lindane)	58-89-9	mg/kg	< 0.32 U	< 0.0526 UD	< 0.1 U	
gamma-BHC (Lindane)	58-89-9	mg/kg			< 0.1 U	
gamma-BHC (Lindane)	58-89-9	ug/kg				< 1.95 U
gamma-Chlordane	5103-74-2	ug/kg				< 1.95 U
gamma-Chlordane	5103-74-2	mg/kg	0.47 NJ	0.12 DNJ		

Table B-2
Historical Analytical Results for Sediment at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118
		Location ID	D-B-SB-SD-44	D-B-SB-SD-45	D-SDBS-25	D-SDBS-25
		Sample Date	3/11/1999	3/11/1999	10/26/1993	8/13/2007
		Depth Interval	0 - 1	0 - 1	0 - .5	0 - .5
		Sample ID	BSBSD-44(0-1)	BSBSD-45(0-1)	SDBS-25(0-0.5)	D-SDBS025(0-0.5)
		Sample Matrix	SE	SE	SE	SE
Chemical Name	CAS No	Unit				
Heptachlor	76-44-8	mg/kg	< 0.32 UJ	< 0.0526 UJD	< 0.22 U	
Heptachlor	76-44-8	mg/kg			< 0.24 U	
Heptachlor	76-44-8	ug/kg				< 1.95 U
Heptachlor epoxide	1024-57-3	mg/kg	< 0.32 U	< 0.0526 UD	< 0.13 U	
Heptachlor epoxide	1024-57-3	mg/kg			< 0.48 U	
Heptachlor epoxide	1024-57-3	ug/kg				1.46 J
Isodrin	465-73-6	mg/kg			< 0.48 U	
Isodrin	465-73-6	mg/kg			< 0.3 U	
Malathion	121-75-5	mg/kg	< 6.21 UD	< 10.2 UD	< 0.18 U	
Methoxychlor	72-43-5	mg/kg	< 0.301 UD	< 0.495 UD	< 0.26 U	
Methoxychlor	72-43-5	mg/kg			< 0.0359 UJ	
Methoxychlor	72-43-5	ug/kg				< 1.95 U
Mirex	2385-85-5	mg/kg			< 0.14 U	
Parathion	56-38-2	mg/kg			< 1.7 U	
p-Chlorophenylmethyl sulfide	123-09-1	mg/kg			< 0.097 U	
p-Chlorophenylmethyl sulfone	98-57-7	mg/kg			< 0.066 U	
p-Chlorophenylmethyl sulfoxide	934-73-6	mg/kg			< 0.32 U	
Supona	470-90-6	mg/kg			< 0.92 U	
Toxaphene	8001-35-2	ug/kg				< 39.1 U
Toxaphene	8001-35-2	mg/kg	< 6.4 UD	< 10.5 UD	< 12 U	
Toxaphene	8001-35-2	mg/kg			< 0.226 U	
Vapona	62-73-7	mg/kg			< 0.068 U	
Radiological						
Cesium-134	13967-70-9	pCi/g			< 0.025 U	
Cesium-137	10045-97-3	pCi/g			0.42	
Cobalt-60	10198-40-0	pCi/g			< 0.024 U	
Gross Alpha	12587-46-1	pCi/g			34	
Gross beta	12587-47-2	pCi/g			38	
Total Uranium	7440-61-1 U	mg/kg			3.5	
Zinc-65	13982-39-3	pCi/g			< 0.056 U	
SVOC						
1,2,4-Trichlorobenzene	120-82-1	mg/kg			< 0.22 U	
1,2-Dichlorobenzene	95-50-1	mg/kg			< 0.042 U	
1,2-Diphenylhydrazine	122-66-7	mg/kg			< 0.52 U	
1,3-Dichlorobenzene	541-73-1	mg/kg			< 0.042 U	
1,4-Dichlorobenzene	106-46-7	mg/kg			< 0.034 U	
1-Methylnaphthalene	90-12-0	ug/kg				< 13.6 U
2,4,5-Trichlorophenol	95-95-4	mg/kg			< 0.49 U	
2,4,6-Trichlorophenol	88-06-2	mg/kg			< 0.061 U	
2,4-Dichlorophenol	120-83-2	mg/kg			< 0.065 U	
2,4-Dimethylphenol	105-67-9	mg/kg			< 3 U	
2,4-Dinitrophenol	51-28-5	mg/kg			< 4.7 U	
2,6-Dinitroaniline	606-22-4	mg/kg			< 0.57 U	
2-Chloronaphthalene	91-58-7	mg/kg			< 0.24 U	
2-Chlorophenol	95-57-8	mg/kg			< 0.055 U	
2-Methylnaphthalene	91-57-6	mg/kg			< 0.032 U	
2-Methylnaphthalene	91-57-6	ug/kg				< 13.6 U
2-Methylphenol	95-48-7	mg/kg			< 0.098 U	
2-Nitrophenol	88-75-5	mg/kg			< 1.1 U	
3,3'-Dichlorobenzidine	91-94-1	mg/kg			< 1.6 U	
3,5-Dinitroaniline	618-87-1	mg/kg			< 1.6 U	
3-Nitroaniline	99-09-2	mg/kg			< 3 U	
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg			< 0.8 U	
4-Bromophenyl phenyl ether	101-55-3	mg/kg			< 0.041 U	
4-Chloro-3-methylphenol	59-50-7	mg/kg			< 0.93 U	
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg			< 0.17 U	
4-Methylphenol	106-44-5	mg/kg			< 0.24 U#	
4-Nitrophenol	100-02-7	mg/kg			< 3.3 U	
Acenaphthene	83-32-9	mg/kg	0.11 J	< 20.4 UD	< 0.041 U	
Acenaphthene	83-32-9	ug/kg				< 13.6 U
Acenaphthylene	208-96-8	mg/kg	< 0.621 U	< 20.4 UD	< 0.033 U	
Acenaphthylene	208-96-8	ug/kg				< 13.6 U
Anthracene	120-12-7	mg/kg	0.37 J	< 20.4 UD	< 0.71 U	
Anthracene	120-12-7	ug/kg				< 13.6 U
Benz(a)anthracene	56-55-3	mg/kg	< 0.621 U	< 20.4 UD	< 0.041 U	
Benz(a)anthracene	56-55-3	ug/kg				31.9
Benzo(a)pyrene	50-32-8	mg/kg	0.49 J	< 20.4 UD	< 1.2 U	

Table B-2
Historical Analytical Results for Sediment at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118
		Location ID	D-B-SB-SD-44	D-B-SB-SD-45	D-SDBS-25	D-SDBS-25
		Sample Date	3/11/1999	3/11/1999	10/26/1993	8/13/2007
		Depth Interval	0 - 1	0 - 1	0 - .5	0 - .5
		Sample ID	BSBSD-44(0-1)	BSBSD-45(0-1)	SDBS-25(0-0.5)	D-SDBS025(0-0.5)
		Sample Matrix	SE	SE	SE	SE
Chemical Name	CAS No	Unit				
Benzo(a)pyrene	50-32-8	ug/kg				30.2
Benzo(b)fluoranthene	205-99-2	mg/kg	0.6 J	< 20.4 UD	< 0.31 U	
Benzo(b)fluoranthene	205-99-2	ug/kg				33.8
Benzo(g,h,i)perylene	191-24-2	mg/kg	0.22 J	< 20.4 UD	< 0.18 U	
Benzo(g,h,i)perylene	191-24-2	ug/kg				< 13.6 U
Benzo(k)fluoranthene	207-08-9	mg/kg	0.3 J	< 20.4 UD	< 0.13 U	
Benzo(k)fluoranthene	207-08-9	ug/kg				32.4
Benzyl alcohol	100-51-6	mg/kg			< 0.032 U	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg			< 0.19 U	
bis(2-Chloroethyl)ether	111-44-4	mg/kg			< 0.36 U	
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg			< 0.44 U	
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg			< 0.48 U	
Butylbenzyl phthalate	85-68-7	mg/kg			< 1.8 U	
Chrysene	218-01-9	mg/kg	0.6 J	3.41 DJ	< 0.032 U	
Chrysene	218-01-9	ug/kg				33.3
Dibenz(a,h)anthracene	53-70-3	mg/kg	< 0.621 U	< 20.4 UD	< 0.31 U	
Dibenz(a,h)anthracene	53-70-3	ug/kg				< 13.6 U
Dibenzofuran	132-64-9	mg/kg			< 0.38 U	
Dicyclopentadiene	77-73-6	mg/kg			< 0.57 U	
Diethylphthalate	84-66-2	mg/kg			< 0.24 U	
Dimethylphthalate	131-11-3	mg/kg			< 0.063 U	
di-n-Butylphthalate	84-74-2	mg/kg			4.2	
di-n-Octylphthalate	117-84-0	mg/kg			< 0.23 U	
Fluoranthene	206-44-0	mg/kg	1.6	4.33 DJ	0.27	
Fluoranthene	206-44-0	ug/kg				55.2
Fluorene	86-73-7	mg/kg	0.18 J	< 20.4 UD	< 0.065 U	
Fluorene	86-73-7	ug/kg				< 13.6 U
Hexachlorobenzene	118-74-1	mg/kg			< 0.08 U	
Hexachlorobutadiene	87-68-3	mg/kg			< 0.97 U	
Hexachlorocyclopentadiene	77-47-4	mg/kg			< 0.52 U	
Hexachloroethane	67-72-1	mg/kg			< 1.8 U	
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	0.24 J	< 20.4 UD	< 2.4 U	
Indeno(1,2,3-c,d)pyrene	193-39-5	ug/kg				< 13.6 U
Isophorone	78-59-1	mg/kg			< 0.39 U	
Naphthalene	91-20-3	mg/kg	< 0.621 U	< 20.4 UD	< 0.74 U	
Naphthalene	91-20-3	ug/kg				< 13.6 U
N-Nitrosodimethylamine	62-75-9	mg/kg			< 0.46 U	
n-Nitroso-di-n-propylamine	621-64-7	mg/kg			< 1.1 U	
n-Nitrosodiphenylamine	86-30-6	mg/kg			< 0.29 U	
Pentachlorophenol	87-86-5	mg/kg			< 0.76 U	
Phenanthrene	85-01-8	mg/kg	1.17	< 20.4 UD	0.21	
Phenanthrene	85-01-8	ug/kg				20.7 UB
Phenol	108-95-2	mg/kg			< 0.052 U	
Pyrene	129-00-0	mg/kg	1.15	4.02 DJ	0.29	
Pyrene	129-00-0	ug/kg				47.7
TPH						
Total Petroleum Hydrocarbons	TPH	mg/kg			110	
VOC						
1,2,3-Trichlorobenzene	87-61-6	mg/kg			< 0.032 U	
2,3,6-Trichlorophenol	933-75-5	mg/kg			< 0.62 U	
Dibromochloropropane	96-12-8	mg/kg			< 0.071 U	
WetChem						
% Solids	%Solid	%	53.1	32.3		
Cation Exchange Capacity	CEC	mg/kg			5500 D	
Cyanide	57-12-5	mg/kg	1.39	452 D	2.57	
Total organic carbon	TOC	mg/kg			11000	

Table B-3
Historial Analytical Results for Surface Water at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118
		Location ID	D-B-SB-SW-44	D-B-SB-SW-45	D-SWBS-25
		Sample Date	3/11/1999	3/11/1999	10/25/1993
		Depth Interval			
		Sample ID	BSBSW-44(19990311)	BSBSW-45(19990311)	SWBS-25(19931025)
		Sample Matrix	WS	WS	WS
Chemical Name	CAS No	Unit			
Dioxins					
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	ug/L	< 0.038 U	< 0.03 U	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	ug/L	< 0.034 U	< 0.023 U	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	ug/L	< 0.029 U	< 0.02 U	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	ug/L	< 0.031 U	< 0.021 U	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	ug/L	< 0.034 U	< 0.032 U	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	ug/L	< 0.04 U	< 0.03 U	
Octachlorodibenzodioxin	3268-87-9	ug/L	< 0.059 U	< 0.048 U	
Total heptachlorodibenzo-p-dioxins	37871-00-4	ug/L	< 0.038 U	< 0.03 U	
Total hexachlorodibenzo-p-dioxins	34465-46-8	ug/L	< 0.031 U	< 0.022 U	
Total pentachlorodibenzo-p-dioxins	36088-22-9	ug/L	0.05 J	0.04 J	
Total tetrachlorodibenzo-p-dioxins	41903-57-5	ug/L	< 0.04 U	< 0.03 U	
Explosives					
1,3,5-Trinitrobenzene	99-35-4	ug/L			< 0.21 U
1,3-Dinitrobenzene	99-65-0	ug/L			< 0.458 U
2,4,6-Trinitrotoluene	118-96-7	ug/L			< 0.426 U
3-Nitrotoluene	99-08-1	ug/L			< 2.9 U
HMX	2691-41-0	ug/L			< 0.533 U
Nitrobenzene	98-95-3	ug/L			< 0.682 U
Nitrobenzene	98-95-3	ug/L			< 3.7 U
Nitrocellulose	9004-70-0	ug/L			< 222 UBJ
Nitroglycerin	55-63-0	ug/L			< 1.49 U
PETN	78-11-5	ug/L			< 2 U
RDX	121-82-4	ug/L			< 0.416 U
Tetryl	479-45-8	ug/L			< 0.631 U
Explosives / SVOC					
2,4-Dinitrotoluene	121-14-2	ug/L			< 5.8 U
2,4-Dinitrotoluene	121-14-2	ug/L			< 0.397 U
2,6-Dinitrotoluene	606-20-2	ug/L			< 6.7 U
2,6-Dinitrotoluene	606-20-2	ug/L			< 0.6 U
Furans					
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	ug/L	< 0.028 U	< 0.016 U	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	ug/L	< 0.031 U	< 0.019 U	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	ug/L	< 0.038 U	< 0.02 U	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	ug/L	< 0.034 U	< 0.018 U	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	ug/L	< 0.042 U	< 0.022 U	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	ug/L	< 0.024 U	< 0.023 U	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	ug/L	< 0.039 U	< 0.02 U	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	ug/L	< 0.023 U	< 0.022 U	
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	ug/L	< 0.034 U	< 0.027 U	
Octachlorodibenzofuran	39001-02-0	ug/L	< 0.035 U	< 0.03 U	
Total heptachlorodibenzofurans	38998-75-3	ug/L	< 0.03 U	< 0.017 U	
Total hexachlorodibenzofurans	55684-94-1	ug/L	< 0.038 U	< 0.02 U	
Total pentachlorodibenzofurans	30402-15-4	ug/L	0.12 J	< 0.023 U	
Total tetrachlorodibenzofurans	30402-14-3	ug/L	< 0.034 U	< 0.027 U	
Metals					
Aluminum	7429-90-5	ug/L	110 J	< 200 U	< 112 U
Antimony	7440-36-0	ug/L	< 10 U	< 10 U	< 60 U
Arsenic	7440-38-2	ug/L	< 10 U	< 10 U	< 2.35 U
Barium	7440-39-3	ug/L	23 J	23 J	20.6
Beryllium	7440-41-7	ug/L	< 5 U	< 5 U	< 1.12 U
Boron	7440-42-8	ug/L	< 200 U	< 200 U	
Cadmium	7440-43-9	ug/L	1.1 J	< 2 U	< 6.78 U
Calcium	7440-70-2	ug/L	12700	12500	13200
Chromium	7440-47-3	ug/L	3.7 J	< 5 U	< 16.8 U
Cobalt	7440-48-4	ug/L	< 7 U	< 7 U	< 25 U
Copper	7440-50-8	ug/L	< 25 U	< 25 U	< 18.8 U
Iron	7439-89-6	ug/L	270	180	245
Lead	7439-92-1	ug/L	< 3 U	< 3 U	< 4.47 U
Magnesium	7439-95-4	ug/L	4100 J	4100 J	5030
Manganese	7439-96-5	ug/L	19	18	< 9.67 U
Mercury	7439-97-6	ug/L	< 0.2 U	< 0.2 U	< 0.1 U
Nickel	7440-02-0	ug/L	< 40 U	< 40 U	< 32.1 U
Potassium	7440-09-7	ug/L	550 J	530 J	< 1240 U
Selenium	7782-49-2	ug/L	< 5 U	< 5 U	< 2.53 U
Silver	7440-22-4	ug/L	1.2 J	0.67 J	< 0.333 U
Sodium	7440-23-5	ug/L	13300	12800	14400
Thallium	7440-28-0	ug/L	< 10 U	< 10 U	< 125 U
Titanium	7440-32-6	ug/L	< 50 U	< 50 U	
Vanadium	7440-62-2	ug/L	< 7 U	< 7 U	< 27.6 U
Zinc	7440-66-6	ug/L	36	23	< 18 U
Other					
1,4-Oxathiane	15980-15-1	ug/L			< 27 U
Diisopropyl methylphosphonate	1445-75-6	ug/L			< 21 U
Dimethylmethylphosphonate	756-79-6	ug/L			< 130 U
Dithiane	51330-42-8	ug/L			< 3.3 U

Table B-3
Historial Analytical Results for Surface Water at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118
		Location ID	D-B-SB-SW-44	D-B-SB-SW-45	D-SWBS-25
		Sample Date	3/11/1999	3/11/1999	10/25/1993
		Depth Interval			
		Sample ID	BSBSW-44(19990311)	BSBSW-45(19990311)	SWBS-25(19931025)
		Sample Matrix	WS	WS	WS
Chemical Name	CAS No	Unit			
PCBs					
Aroclor 1016	12674-11-2	ug/L	< 1 U	< 1 U	< 0.385 U
Aroclor 1221	11104-28-2	ug/L	< 1 U	< 1 U	< 0.385 UT
Aroclor 1232	11141-16-5	ug/L	< 1 U	< 1 U	< 0.385 UT
Aroclor 1242	53469-21-9	ug/L	< 1 U	< 1 U	< 0.385 UT
Aroclor 1248	12672-29-6	ug/L	< 1 U	< 1 U	< 0.385 UT
Aroclor 1254	11097-69-1	ug/L	< 1 U	< 1 U	< 0.176 UT
Aroclor 1260	11096-82-5	ug/L	< 1 U	< 1 U	< 0.176 U
Pesticides					
4,4'-DDD	72-54-8	ug/L	< 0.05 U	< 0.05 U	< 18 U
4,4'-DDD	72-54-8	ug/L			< 0.81 U
4,4'-DDE	72-55-9	ug/L	< 0.05 U	< 0.05 U	< 0.39 U
4,4'-DDE	72-55-9	ug/L			< 14 U
4,4'-DDT	50-29-3	ug/L	< 0.05 U	< 0.05 U	< 0.25 U
4,4'-DDT	50-29-3	ug/L			< 18 U
Aldrin	309-00-2	ug/L	< 0.05 U	< 0.05 U	< 13 U
Aldrin	309-00-2	ug/L			< 0.74 U
alpha-BHC	319-84-6	ug/L	< 0.05 U	< 0.05 U	< 0.25 U
alpha-BHC	319-84-6	ug/L			< 5.3 U
alpha-Chlordane	5103-71-9	ug/L	< 0.05 U	< 0.05 U	
Atrazine	1912-24-9	ug/L			< 5.9 U
beta-BHC	319-85-7	ug/L	< 0.05 U	< 0.05 U	< 0.99 U
beta-BHC	319-85-7	ug/L			< 17 U
Bromacil	314-40-9	ug/L			< 2.9 U
Chlordane	57-74-9	ug/L			< 0.0312 UJ
Chlordane	57-74-9	ug/L			< 37 U
delta-BHC	319-86-8	ug/L	< 0.05 U	< 0.05 U	< 0.34 U
Diazinon	333-41-5	ug/L	< 1 U	< 1 U	
Dieldrin	60-57-1	ug/L	< 0.05 U	< 0.05 U	< 26 U
Dieldrin	60-57-1	ug/L			< 0.74 U
Endosulfan I	959-98-8	ug/L	< 0.05 U	< 0.05 U	< 0.25 U
Endosulfan I	959-98-8	ug/L			< 23 U
Endosulfan II	33213-65-9	ug/L	< 0.05 U	< 0.05 U	< 42 U
Endosulfan II	33213-65-9	ug/L			< 0.77 U
Endosulfan sulfate	1031-07-8	ug/L	< 0.05 U	< 0.05 U	< 50 U
Endosulfan sulfate	1031-07-8	ug/L			< 0.25 UT
Endrin	72-20-8	ug/L	< 0.05 U	< 0.05 U	< 18 U
Endrin	72-20-8	ug/L			< 0.0176 U
Endrin aldehyde	7421-93-4	ug/L	< 0.05 U	< 0.05 U	< 0.0504 U
Endrin aldehyde	7421-93-4	ug/L			< 5 U
Endrin ketone	53494-70-5	ug/L	< 0.05 U	< 0.05 U	< 0.25 UT
gamma-BHC (Lindane)	58-89-9	ug/L	< 0.05 U	< 0.05 U	< 0.25 U
gamma-BHC (Lindane)	58-89-9	ug/L			< 7.2 U
gamma-Chlordane	5103-74-2	ug/L	< 0.05 U	< 0.05 U	
Heptachlor	76-44-8	ug/L	< 0.05 U	< 0.05 U	< 38 U
Heptachlor	76-44-8	ug/L			< 0.25 U
Heptachlor epoxide	1024-57-3	ug/L	< 0.05 U	< 0.05 U	< 28 U
Heptachlor epoxide	1024-57-3	ug/L			< 0.63 U
Isodrin	465-73-6	ug/L			< 0.25 U
Isodrin	465-73-6	ug/L			< 7.8 U
Malathion	121-75-5	ug/L	< 1 U	< 1 U	< 21 U
Methoxychlor	72-43-5	ug/L	< 0.1 U	< 0.1 U	< 11 U
Methoxychlor	72-43-5	ug/L			< 0.075 UJ
Mirex	2385-85-5	ug/L			< 24 U
Parathion	56-38-2	ug/L			< 37 U
p-Chlorophenylmethyl sulfide	123-09-1	ug/L			< 10 U
p-Chlorophenylmethyl sulfone	98-57-7	ug/L			< 5.3 U
p-Chlorophenylmethyl sulfoxide	934-73-6	ug/L			< 15 U
Supona	470-90-6	ug/L			< 19 U
Toxaphene	8001-35-2	ug/L	< 2 U	< 2 U	< 1.64 U
Vapona	62-73-7	ug/L			< 8.5 U
Radiological					
Cesium-134	13967-70-9	pCi/L			< 6.9 U
Cesium-137	10045-97-3	pCi/L			< 7.8 U
Cobalt-60	10198-40-0	pCi/L			< 8.8 U
Gross Alpha	12587-46-1	pCi/L			0.67
Gross beta	12587-47-2	pCi/L			2.6
Total Uranium	7440-61-1 U	ug/L			< 0.11 U
Zinc-65	13982-39-3	pCi/L			< 17 U

Table B-3
Historial Analytical Results for Surface Water at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118
		Location ID	D-B-SB-SW-44	D-B-SB-SW-45	D-SWBS-25
		Sample Date	3/11/1999	3/11/1999	10/25/1993
		Depth Interval			
		Sample ID	BSBSW-44(19990311)	BSBSW-45(19990311)	SWBS-25(19931025)
		Sample Matrix	WS	WS	WS
Chemical Name	CAS No	Unit			
SVOC					
1,1,2,2-Tetrachloroethane	79-34-5	ug/L			< 1.5 U
1,2,4-Trichlorobenzene	120-82-1	ug/L			< 2.4 U
1,2-Dichlorobenzene	95-50-1	ug/L			< 1.2 U
1,2-Diphenylhydrazine	122-66-7	ug/L			< 13 U
1,3-Dichlorobenzene	541-73-1	ug/L			< 1 U
1,3-Dichlorobenzene	541-73-1	ug/L			< 3.4 U
1,4-Dichlorobenzene	106-46-7	ug/L			< 1.5 U
2,4,5-Trichlorophenol	95-95-4	ug/L			< 2.8 U
2,4,6-Trichlorophenol	88-06-2	ug/L			< 3.6 U
2,4-Dichlorophenol	120-83-2	ug/L			< 8.4 U
2,4-Dimethylphenol	105-67-9	ug/L			< 4.4 U
2,4-Dinitrophenol	51-28-5	ug/L			< 180 U
2,6-Dinitroaniline	606-22-4	ug/L			< 8.8 U
2-Chloronaphthalene	91-58-7	ug/L			< 2.6 U
2-Chlorophenol	95-57-8	ug/L			< 2.8 U
2-Methylnaphthalene	91-57-6	ug/L			< 1.3 U
2-Methylphenol	95-48-7	ug/L			< 3.6 U
2-Nitrophenol	88-75-5	ug/L			< 8.2 U
3,3'-Dichlorobenzidine	91-94-1	ug/L			< 5 U
3,5-Dinitroaniline	618-87-1	ug/L			< 21 U
3-Nitroaniline	99-09-2	ug/L			< 15 U
4-Bromophenyl phenyl ether	101-55-3	ug/L			< 22 U
4-Chloro-3-methylphenol	59-50-7	ug/L			< 8.5 U
4-Chlorophenyl phenyl ether	7005-72-3	ug/L			< 23 U
4-Methylphenol	106-44-5	ug/L			< 2.8 U#
4-Nitrophenol	100-02-7	ug/L			< 96 U
Acenaphthene	83-32-9	ug/L	< 10 U	< 10 U	< 5.8 U
Acenaphthylene	208-96-8	ug/L	< 10 U	< 10 U	< 5.1 U
Anthracene	120-12-7	ug/L	< 10 U	< 10 U	< 5.2 U
Benz(a)anthracene	56-55-3	ug/L	< 10 U	< 10 U	< 9.8 U
Benzo(a)pyrene	50-32-8	ug/L	< 10 U	< 10 U	< 14 U
Benzo(b)fluoranthene	205-99-2	ug/L	< 10 U	< 10 U	< 10 U
Benzo(g,h,i)perylene	191-24-2	ug/L	< 10 U	< 10 U	< 15 U
Benzo(k)fluoranthene	207-08-9	ug/L	< 10 U	< 10 U	< 10 U
Benzyl alcohol	100-51-6	ug/L			< 4 U
bis(2-Chloroethoxy)methane	111-91-1	ug/L			< 6.8 U
bis(2-Chloroethyl)ether	111-44-4	ug/L			< 0.68 U
bis(2-Chloroisopropyl)ether	39638-32-9	ug/L			< 5 U
bis(2-Ethylhexyl)phthalate	117-81-7	ug/L			< 7.7 U
Butylbenzyl phthalate	85-68-7	ug/L			< 28 U
Chrysene	218-01-9	ug/L	< 10 U	< 10 U	< 7.4 U
Dibenz(a,h)anthracene	53-70-3	ug/L	< 10 U	< 10 U	< 12 U
Dibenzofuran	132-64-9	ug/L			< 5.1 U
Dichlorobenzenes	25321-22-6	ug/L			< 2 U
Dicyclopentadiene	77-73-6	ug/L			< 5.5 U
Diethylphthalate	84-66-2	ug/L			< 5.9 U
Dimethylphthalate	131-11-3	ug/L			< 2.2 U
di-n-Butylphthalate	84-74-2	ug/L			< 33 U
di-n-Octylphthalate	117-84-0	ug/L			< 1.5 U
Fluoranthene	206-44-0	ug/L	< 10 U	< 10 U	< 24 U
Fluorene	86-73-7	ug/L	< 10 U	< 10 U	< 9.2 U
Hexachlorobenzene	118-74-1	ug/L			< 12 U
Hexachlorobutadiene	87-68-3	ug/L			< 8.7 U
Hexachlorocyclopentadiene	77-47-4	ug/L			< 54 U
Hexachloroethane	67-72-1	ug/L			< 8.3 U
Indeno(1,2,3-c,d)pyrene	193-39-5	ug/L	< 10 U	< 10 U	< 21 U
Isophorone	78-59-1	ug/L			< 2.4 U
Naphthalene	91-20-3	ug/L	< 10 U	< 10 U	< 0.5 U
N-Nitrosodimethylamine	62-75-9	ug/L			< 9.7 U
n-Nitroso-di-n-propylamine	621-64-7	ug/L			< 6.8 U
n-Nitrosodiphenylamine	86-30-6	ug/L			< 3.7 U
Pentachlorophenol	87-86-5	ug/L			< 9.1 U
Phenanthrene	85-01-8	ug/L	< 10 U	< 10 U	< 9.9 U
Phenol	108-95-2	ug/L			< 2.2 U
Pyrene	129-00-0	ug/L	< 10 U	< 10 U	< 17 U

Table B-3
Historial Analytical Results for Surface Water at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118
		Location ID	D-B-SB-SW-44	D-B-SB-SW-45	D-SWBS-25
		Sample Date	3/11/1999	3/11/1999	10/25/1993
		Depth Interval			
		Sample ID	BSBSW-44(19990311)	BSBSW-45(19990311)	SWBS-25(19931025)
		Sample Matrix	WS	WS	WS
Chemical Name	CAS No	Unit			
TPH					
Total Petroleum Hydrocarbons	TPH	ug/L			< 100 U
VOC					
1,1,1-Trichloroethane	71-55-6	ug/L			< 1 U
1,1,2-Trichloroethane	79-00-5	ug/L			< 1 U
1,1-Dichloroethane	75-34-3	ug/L			< 1 U
1,1-Dichloroethene	75-35-4	ug/L			< 1 U
1,2,3-Trichlorobenzene	87-61-6	ug/L			< 5.8 U
1,2-Dichloroethane	107-06-2	ug/L			< 1 U
1,2-Dichloroethene (total)	540-59-0	ug/L			< 5 U
1,2-Dichloropropane	78-87-5	ug/L			< 1 U
1,3-Dichloropropane	142-28-9	ug/L			< 4.8 U
2,3,6-Trichlorophenol	933-75-5	ug/L			< 1.7 U
2-Butanone	78-93-3	ug/L			< 10 U
2-Chloroethyl vinyl ether	110-75-8	ug/L			< 3.5 U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L			< 1.4 U
Acetone	67-64-1	ug/L			< 8 U
Acrylonitrile	107-13-1	ug/L			< 8.4 U
Benzene	71-43-2	ug/L			< 1 U
Bromodichloromethane	75-27-4	ug/L			< 1 U
Bromoform	75-25-2	ug/L			< 11 U
Bromomethane	74-83-9	ug/L			< 14 U
Carbon tetrachloride	56-23-5	ug/L			< 1 U
Chlorobenzene	108-90-7	ug/L			< 1 U
Chloroethane	75-00-3	ug/L			< 8 U
Chloroform	67-66-3	ug/L			< 1 U
Chloromethane	74-87-3	ug/L			< 1.2 U
Dibromochloromethane	124-48-1	ug/L			< 1 U
Dibromochloropropane	96-12-8	ug/L			< 12 U
Ethyl benzene	100-41-4	ug/L			< 1 U
Methylene chloride	75-09-2	ug/L			< 1 U
m-Xylenes	108-38-3	ug/L			< 1 U
Tetrachloroethene	127-18-4	ug/L			< 1 U
Toluene	108-88-3	ug/L			< 1 U
Trichloroethene	79-01-6	ug/L			< 1 U
Trichlorofluoromethane	75-69-4	ug/L			< 1 U
Vinyl chloride	75-01-4	ug/L			< 12 U
Xylenes	1330-20-7	ug/L			< 2 U
WetChem					
Cyanide	57-12-5	ug/L	< 10 UJ	< 10 U	< 5 U
Hardness	HARDNESS	ug/L			52000

Table B-4
Historical Analytical Results for Groundwater at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118
		Location ID	D-I-2	D-I-2	D-I-2	D-I-2	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW-I	D-MW-I	D-MW-I
		Sample Date	10/24/1993	4/18/1994	7/18/1994	12/15/1997	4/18/1994	4/18/1994	7/18/1994	7/18/1994	12/12/1997	12/15/1997	10/24/1993	4/18/1994	7/18/1994
		Depth Interval	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	9 - 29	9 - 29	9 - 29
		Sample ID	I-2(19931024)	I-2(19940418)	I-2(19940718)	I-2(19971215)	MW118-1D(19940418)	MW118-1(19940418)	MW118-1D(19940718)	MW118-1(19940718)	MW118-1(19971212)	MW118-1(19971215)	MW-I(19931024)	MW-I(19940418)	MW-I(19940718)
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Chemical Name	CAS No	Unit													
Dissolved Gas															
Ethane	74-84-0	ug/L				< 0.249 U						< 0.249 U			
Ethene	74-85-1	ug/L				< 0.151 U						< 0.151 U			
Hydrogen	1333-74-0	nM									0.33				
Methane	74-82-8	ug/L				0.47						0.71			
Explosives															
1,3,5-Trinitrobenzene	99-35-4	ug/L					0.5 NJ	0.39 NJ	< 0.21 U	< 0.21 U					
1,3-Dinitrobenzene	99-65-0	ug/L					< 0.458 U	< 0.458 U	< 0.458 U	< 0.458 U					
2,4,6-Trinitrotoluene	118-96-7	ug/L					< 0.426 U	< 0.426 U	< 0.426 U	< 0.426 U					
3-Nitrotoluene	99-08-1	ug/L	< 2.9 U	< 2.9 U	< 2.9 U		< 2.9 U	< 2.9 U	< 2.9 U	< 2.9 U			< 2.9 U	< 2.9 U	< 2.9 U
HMX	2691-41-0	ug/L					< 0.533 U	< 0.533 U	< 0.533 U	< 0.533 U					
Nitrobenzene	98-95-3	ug/L	< 3.7 U	< 3.7 U	< 3.7 U		< 0.682 U	< 0.682 U	< 3.7 U	< 0.682 U			< 3.7 U	< 3.7 U	< 3.7 U
Nitrobenzene	98-95-3	ug/L					< 3.7 U	< 3.7 U	< 0.682 U	< 3.7 U					
Nitrocellulose	9004-70-0	ug/L					424	< 222 U	< 222 U	< 222 U					
Nitroglycerin	55-63-0	ug/L					< 1.49 U	< 1.49 U	< 1.49 U	< 1.49 U					
PETN	78-11-5	ug/L					< 2 U	< 2 U	< 2 U	< 2 U					
RDX	121-82-4	ug/L					< 0.416 U	< 0.416 U	< 0.416 U	< 0.416 U					
Tetryl	479-45-8	ug/L					< 0.631 U	< 0.631 U	< 0.631 U	< 0.631 U					
Explosives / SVOC															
2,4-Dinitrotoluene	121-14-2	ug/L	< 5.8 U	< 5.8 U	< 5.8 U		< 5.8 U	< 0.397 U	< 5.8 U	< 5.8 U			< 5.8 U	< 5.8 U	< 5.8 U
2,4-Dinitrotoluene	121-14-2	ug/L					< 0.397 U	< 5.8 U	< 0.397 R	< 0.397 R					
2,6-Dinitrotoluene	606-20-2	ug/L	< 6.7 U	< 6.7 U	< 6.7 U		< 0.6 U	< 0.6 U	< 6.7 U	< 6.7 U			< 6.7 U	< 6.7 U	< 6.7 U
2,6-Dinitrotoluene	606-20-2	ug/L					< 6.7 U	< 6.7 U	< 0.6 U	< 0.6 U					
Herbicide															
Merphos	150-50-5	ug/L	< 2 U										< 2 U		
Metals															
Aluminum	7429-90-5	ug/L	< 112 U	< 112 U	< 112 U		< 112 U	< 112 U	137	188			174	< 112 U	149
Aluminum	7429-90-5	ug/L	< 112 U				< 112 U	< 112 U					< 112 U		
Antimony	7440-36-0	ug/L	< 60 U	< 60 U	< 60 U		< 60 U	< 60 U	< 60 U	< 60 U			< 60 U	< 60 U	< 60 U
Antimony	7440-36-0	ug/L	< 60 U				< 60 U	< 60 U					< 60 U		
Arsenic	7440-38-2	ug/L	5.68	5.33	4.91		< 2.35 U	< 2.35 U	< 2.35 U	< 2.35 U			6.88	2.57	< 2.35 U
Arsenic	7440-38-2	ug/L	8.19				< 2.35 U	< 2.35 U					< 2.35 U		
Barium	7440-39-3	ug/L	51.5	54.2 J	45.3 J		18.3 J	19.2 J	17.5 J	16.8 J			68.6	136 J	87.8 J
Barium	7440-39-3	ug/L	65.8				16.9 J	17.5 J					455		
Beryllium	7440-41-7	ug/L	< 1.12 U	< 1.12 U	2.58		< 1.12 U	< 1.12 U	< 1.12 U	< 1.12 U			< 1.12 U	< 1.12 U	2.39
Beryllium	7440-41-7	ug/L	< 1.12 U				< 1.12 U	< 1.12 U					< 1.12 U		
Cadmium	7440-43-9	ug/L	< 6.78 U	< 6.78 U	< 6.78 U		< 6.78 U	< 6.78 U	< 6.78 U	< 6.78 U			< 6.78 U	< 6.78 U	< 6.78 U
Cadmium	7440-43-9	ug/L	< 6.78 U				< 6.78 U	< 6.78 U					< 6.78 U		
Calcium	7440-70-2	ug/L	61200	59900	59200		50100	52200	47100	50700			43000	44500	54200
Calcium	7440-70-2	ug/L	60600				50400	55200					43400		
Chromium	7440-47-3	ug/L	< 16.8 U	27	49.7		< 16.8 U	< 16.8 U	< 16.8 U	< 16.8 U			< 16.8 U	< 16.8 U	< 16.8 U
Chromium	7440-47-3	ug/L	100				< 16.8 U	< 16.8 U					< 16.8 U		
Cobalt	7440-48-4	ug/L	< 25 U	< 25 U	< 25 U		< 25 U	< 25 U	< 25 U	< 25 U			< 25 U	< 25 U	< 25 U
Cobalt	7440-48-4	ug/L	< 25 U				< 25 U	< 25 U					< 25 U		
Copper	7440-50-8	ug/L	< 18.8 U	< 18.8 U	< 18.8 U		< 18.8 U	< 18.8 U	< 18.8 U	< 18.8 U			31.9	< 18.8 U	< 18.8 U
Copper	7440-50-8	ug/L	< 18.8 U				< 18.8 U	< 18.8 U					< 18.8 U		
Iron	7439-89-6	ug/L	887	249	425		< 77.5 U	129	234	259			< 77.5 U	873	775
Iron	7439-89-6	ug/L	< 77.5 U				116	< 77.5 U					2020		
Lead	7439-92-1	ug/L	23.5	17.8	< 4.47 U		< 4.47 U	< 4.47 U	< 4.47 U	< 4.47 U			< 4.47 U	27.1	< 4.47 U
Lead	7439-92-1	ug/L	< 4.47 U				< 4.47 U	< 4.47 U					6.01		
Magnesium	7439-95-4	ug/L	20800	21100	20000		20900	22000	20300	21800			18000	19100	22600
Magnesium	7439-95-4	ug/L	20900				21400	23900					18300		
Manganese	7439-96-5	ug/L	558	297	287		64.9	131	125	117			19000 D	3820	2550
Manganese	7439-96-5	ug/L	308				101	67.7					62 D		
Mercury	7439-97-6	ug/L	< 0.1 U	< 0.1 U	< 0.1 U		< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U			0.2	< 0.1 U	< 0.1 U
Mercury	7439-97-6	ug/L	< 0.1 U				< 0.1 U	< 0.1 U					< 0.1 U		
Nickel	7440-02-0	ug/L	131	54.1	90.1		< 32.1 U	< 32.1 U	< 32.1 U	< 32.1 U			< 32.1 U	< 32.1 U	< 32.1 U
Nickel	7440-02-0	ug/L	59				< 32.1 U	< 32.1 U					< 32.1 U		
Potassium	7440-09-7	ug/L	1370	< 1240 U	< 1240 U		1480	< 1240 U	< 1240 U	< 1240 U			1620	1640	1420
Potassium	7440-09-7	ug/L	< 1240 U				< 1240 U	1510					1680		
Selenium	7782-49-2	ug/L	< 2.53 U	< 2.53 U	< 2.53 U		< 2.53 U	< 2.53 U	< 2.53 U	< 2.53 U			< 2.53 U	< 2.53 U	< 2.53 U
Selenium	7782-49-2	ug/L	< 2.53 U				< 2.53 U	< 2.53 U					< 2.53 U		
Silver	7440-22-4	ug/L	< 0.333 U	< 0.333 U	< 0.333 U		< 0.333 U	< 0.333 U	< 0.333 U	< 0.333 U			< 0.333 U	< 0.333 U	< 0.333 U
Silver	7440-22-4	ug/L	< 0.333 U				< 0.333 U	< 0.333 U					< 0.333 U		
Sodium	7440-23-5	ug/L	37500	42700	35200		64900	76800	53900	58500			84000 D	66200	73900
Sodium	7440-23-5	ug/L	36800				63200	66600					81000 D		
Thallium	7440-28-0	ug/L	< 125 U	< 125 U	< 125 U		< 125 U	< 125 U	< 125 U	< 125 U			< 125 U	< 125 U	< 125 U
Thallium	7440-28-0	ug/L	< 125 U				< 125 U	< 125 U					< 125 U		
Vanadium	7440-62-2	ug/L	< 27.6 U	< 27.6 U	< 27.6 U		< 27.6 U	< 27.6 U	< 27.6 U	< 27.6 U			< 27.6 U	< 27.6 U	< 27.6 U
Vanadium	7440-62-2	ug/L	< 27.6 U				< 27.6 U	< 27.6 U					< 27.6 U		
Zinc	7440-66-6	ug/L	20.6 J	< 18 U	21.2		< 18 U	< 18 U	< 18 U	< 18 U			< 18 UJ	< 18 U	43.8
Zinc	7440-66-6	ug/L	26.3 J				< 18 U	< 18 U					32.9 J		

Table B-4
Historical Analytical Results for Groundwater at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118
		Location ID	D-I-2	D-I-2	D-I-2	D-I-2	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW-I	D-MW-I	D-MW-I
		Sample Date	10/24/1993	4/18/1994	7/18/1994	12/15/1997	4/18/1994	4/18/1994	7/18/1994	7/18/1994	12/12/1997	12/15/1997	10/24/1993	4/18/1994	7/18/1994
		Depth Interval	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	9 - 29	9 - 29	9 - 29
		Sample ID	I-2(19931024)	I-2(19940418)	I-2(19940718)	I-2(19971215)	MW118-1D(19940418)	MW118-1(19940418)	MW118-1D(19940718)	MW118-1(19940718)	MW118-1(19971212)	MW118-1(19971215)	MW-I(19931024)	MW-I(19940418)	MW-I(19940718)
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Chemical Name	CAS No	Unit													
Other															
1,4-Oxathiane	15980-15-1	ug/L	< 27 U	< 27 U	< 27 U		< 27 U	< 27 U	< 27 U	< 27 U			< 27 U	< 27 U	< 27 U
Diisopropyl methylphosphonate	1445-75-6	ug/L	< 21 U	< 21 U	< 21 U		< 21 U	< 21 U	< 21 U	< 21 U			< 21 U	< 21 U	< 21 U
Dimethylmethylphosphonate	756-79-6	ug/L	< 130 U	< 130 U	< 130 U		< 130 U	< 130 U	< 130 U	< 130 U			< 130 U	< 130 U	< 130 U
Dithiane	51330-42-8	ug/L	< 3.3 U	< 3.3 U	< 3.3 U		< 3.3 U	< 3.3 U	< 3.3 U	< 3.3 U			< 3.3 U	< 3.3 U	< 3.3 U
PCBs															
Aroclor 1016	12674-11-2	ug/L	< 0.385 U	< 0.385 U	< 0.385 U		< 0.385 U	< 0.385 U	< 0.385 U	< 0.385 U			< 0.385 U	< 0.385 U	< 0.385 U
Aroclor 1221	11104-28-2	ug/L	< 0.385 UT	< 0.385 UT	< 0.385 UT		< 0.385 UT	< 0.385 UT	< 0.385 UT	< 0.385 UT			< 0.385 UT	< 0.385 UT	< 0.385 UT
Aroclor 1232	11141-16-5	ug/L	< 0.385 UT	< 0.385 UT	< 0.385 UT		< 0.385 UT	< 0.385 UT	< 0.385 UT	< 0.385 UT			< 0.385 UT	< 0.385 UT	< 0.385 UT
Aroclor 1242	53469-21-9	ug/L	< 0.385 UT	< 0.385 UT	< 0.385 UT		< 0.385 UT	< 0.385 UT	< 0.385 UT	< 0.385 UT			< 0.385 UT	< 0.385 UT	< 0.385 UT
Aroclor 1248	12672-29-6	ug/L	< 0.385 UT	< 0.385 UT	< 0.385 UT		< 0.385 UT	< 0.385 UT	< 0.385 UT	< 0.385 UT			< 0.385 UT	< 0.385 UT	< 0.385 UT
Aroclor 1254	11097-69-1	ug/L	< 0.176 UT	< 0.176 UT	< 0.176 UT		< 0.176 UT	< 0.176 UT	< 0.176 UT	< 0.176 UT			< 0.176 UT	< 0.176 UT	< 0.176 UT
Aroclor 1260	11096-82-5	ug/L	< 0.176 U	< 0.176 U	< 0.176 U		< 0.176 U	< 0.176 U	< 0.176 U	< 0.176 U			< 0.176 U	< 0.176 U	< 0.176 U
Pesticides															
4,4'-DDD	72-54-8	ug/L	< 0.81 U	< 0.81 U	< 18 U		< 18 U	< 18 U	< 18 U	< 18 U			< 18 U	< 18 U	< 18 U
4,4'-DDD	72-54-8	ug/L	< 18 U	< 18 U	< 0.81 U		< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U			< 0.81 U	< 0.81 U	< 0.81 U
4,4'-DDE	72-55-9	ug/L	< 14 U	< 0.39 U	< 14 U		< 14 U	< 14 U	< 14 U	< 14 U			< 14 U	< 14 U	< 0.39 U
4,4'-DDE	72-55-9	ug/L	< 0.39 U	< 14 U	< 0.39 U		< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U			< 0.39 U	< 0.39 U	< 14 U
4,4'-DDT	50-29-3	ug/L	< 18 U	< 18 U	< 18 U		< 18 U	< 18 U	< 0.25 U	< 18 U			< 18 U	< 0.25 U	< 0.25 U
4,4'-DDT	50-29-3	ug/L	< 0.25 U	< 0.25 U	< 0.25 U		< 0.25 U	< 0.25 U	< 18 U	< 0.25 U			0.33	< 18 U	< 18 U
Aldrin	309-00-2	ug/L	< 0.74 U	< 0.74 U	< 13 U		< 13 U	< 0.74 U	< 13 U	< 0.74 U			< 13 U	< 13 U	< 13 U
Aldrin	309-00-2	ug/L	< 13 U	< 13 U	< 0.74 U		< 0.74 U	< 13 U	< 0.74 U	< 13 U			< 0.74 U	< 0.74 U	< 0.74 U
alpha-BHC	319-84-6	ug/L	< 0.25 U	< 5.3 U	< 5.3 U		< 5.3 U	< 5.3 U	< 5.3 U	< 5.3 U			< 5.3 U	< 0.25 U	< 0.25 U
alpha-BHC	319-84-6	ug/L	< 5.3 U	< 0.25 U	< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U			< 0.25 U	< 5.3 U	< 5.3 U
Atrazine	1912-24-9	ug/L	< 5.9 U	< 5.9 U	< 5.9 U		< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U			< 5.9 U	< 5.9 U	< 5.9 U
Azinphos methyl	86-50-0	ug/L	< 2 U										< 2 U		
beta-BHC	319-85-7	ug/L	< 0.99 U	< 0.99 U	< 0.99 U		< 0.99 U	< 17 U	< 0.99 U	< 17 U			< 17 U	< 17 U	< 0.99 U
beta-BHC	319-85-7	ug/L	< 17 U	< 17 U	< 17 U		< 17 U	< 0.99 U	< 17 U	< 0.99 U			< 0.99 U	< 0.99 U	< 17 U
Bolstar	35400-43-2	ug/L	< 2 U										< 2 U		
Bromacil	314-40-9	ug/L	< 2.9 U	< 2.9 U	< 2.9 U		< 2.9 U	< 2.9 U	< 2.9 U	< 2.9 U			< 2.9 U	< 2.9 U	< 2.9 U
Chlordane	57-74-9	ug/L	< 0.0312 U	< 37 U	< 37 U		< 0.0312 U	< 0.0312 U	< 0.0312 U	< 0.0312 U			< 0.0312 U	< 37 U	< 0.0312 U
Chlordane	57-74-9	ug/L	< 37 U	< 0.0312 U	< 0.0312 U		< 37 U	< 37 U	< 37 U	< 37 U			< 37 U	< 0.0312 U	< 37 U
Chlorpyrifos	2921-88-2	ug/L	< 1 U										< 1 U		
Coumaphos	56-72-4	ug/L	< 5 U										< 5 U		
delta-BHC	319-86-8	ug/L	< 0.34 U	< 0.34 U	< 0.34 U		< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U			< 0.34 U	< 0.34 U	< 0.34 U
Demeton-S	126-75-0	ug/L	< 1 U										< 1 U		
Diazinon	333-41-5	ug/L	< 1 U										< 1 U		
Dieldrin	60-57-1	ug/L	< 0.74 U	< 26 U	< 26 U		< 0.74 U	< 0.74 U	< 0.74 U	< 26 U			< 0.74 U	< 0.74 U	< 26 U
Dieldrin	60-57-1	ug/L	< 26 U	< 0.74 U	< 0.74 U		< 26 U	< 26 U	< 26 U	< 0.74 U			< 26 U	< 26 U	< 0.74 U
Disulfoton	298-04-4	ug/L	< 0.5 U										< 0.5 U		
Endosulfan I	959-98-8	ug/L	< 23 U	< 23 U	< 23 U		< 23 U	< 23 U	< 23 U	< 0.25 U			< 0.25 U	< 0.25 U	< 0.25 U
Endosulfan I	959-98-8	ug/L	< 0.25 U	< 0.25 U	< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	< 23 U			< 23 U	< 23 U	< 23 U
Endosulfan II	33213-65-9	ug/L	< 0.77 U	< 42 U	< 0.77 U		< 0.77 U	< 42 U	< 0.77 U	< 42 U			< 42 U	< 42 U	< 42 U
Endosulfan II	33213-65-9	ug/L	< 42 U	< 0.77 U	< 42 U		< 42 U	< 0.77 U	< 42 U	< 0.77 U			< 0.77 U	< 0.77 U	< 0.77 U
Endosulfan sulfate	1031-07-8	ug/L	< 0.25 UT	< 0.25 UT	0.43 N		< 0.25 UT	< 50 U	< 50 U	0.33 N			< 50 U	< 0.25 UT	< 50 U
Endosulfan sulfate	1031-07-8	ug/L	< 50 U	< 50 U	< 50 U		< 50 U	< 0.25 UT	0.38 N	< 50 U			< 0.25 UT	< 50 U	0.41 N
Endrin	72-20-8	ug/L	< 18 U	< 18 U	< 18 U		< 18 U	< 18 U	< 0.0176 U	< 18 U			< 0.0176 U	< 0.0176 U	< 0.0176 U
Endrin	72-20-8	ug/L	< 0.0176 U	< 0.0176 U	< 0.0176 U		< 0.0176 U	< 0.0176 U	< 18 U	< 0.0176 U			< 18 U	< 18 U	< 18 U
Endrin aldehyde	7421-93-4	ug/L	< 5 U	< 0.0504 U	< 0.0504 U		< 5 U	< 0.0504 U	< 0.0504 U	< 5 U			< 5 U	< 5 U	< 0.0504 U
Endrin aldehyde	7421-93-4	ug/L	< 0.0504 U	< 5 U	< 5 U		< 0.0504 U	< 5 U	< 5 U	< 0.0504 U			< 0.0504 U	< 0.0504 U	< 5 U
Endrin ketone	53494-70-5	ug/L	< 0.25 UT	< 0.25 UT	< 0.25 UT		< 0.25 UT	< 0.25 UT	< 0.25 UT	< 0.25 UT			< 0.25 UT	< 0.25 UT	< 0.25 UT
Ethoprop	13194-48-4	ug/L	< 10 U										< 10 U		
Fenchlorphos	299-84-3	ug/L	< 0.5 U										< 0.5 U		
Fensulfothion	115-90-2	ug/L	< 5 U										< 5 U		
Fenthion	55-38-9	ug/L	< 2 U										< 2 U		
gamma-BHC (Lindane)	58-89-9	ug/L	< 7.2 U	< 0.25 U	< 0.25 U		< 0.25 U	< 0.25 U	< 7.2 U	< 0.25 U			< 0.25 U	< 7.2 U	< 7.2 U
gamma-BHC (Lindane)	58-89-9	ug/L	< 0.25 U	< 7.2 U	< 7.2 U		< 7.2 U	< 7.2 U	< 0.25 U	< 7.2 U			< 7.2 U	< 0.25 U	< 0.25 U
Heptachlor	76-44-8	ug/L	< 0.25 U	< 38 U	< 0.25 U		< 38 U	< 38 U	< 0.25 U	< 38 U			< 38 U	< 0.25 U	< 38 U
Heptachlor	76-44-8	ug/L	< 38 U	< 0.25 U	< 38 U		< 0.25 U	< 0.25 U	< 38 U	< 0.25 U			< 0.25 U	< 38 U	< 0.25 U
Heptachlor epoxide	1024-57-3	ug/L	< 28 U	< 0.63 U	< 0.63 U		< 0.63 U	< 0.63 U	< 28 U	< 0.63 U			< 0.63 U	< 28 U	< 0.63 U
Heptachlor epoxide	1024-57-3	ug/L	< 0.63 U	< 28 U	< 28 U		< 28 U	< 28 U	< 0.63 U	< 28 U			< 28 U	< 0.63 U	< 28 U
Isodrin	465-73-6	ug/L	< 0.25 U	< 7.8 U	< 7.8 U		< 7.8 U	< 7.8 U	< 7.8 U	< 0.25 U			< 7.8 U	< 0.25 U	< 7.8 U
Isodrin	465-73-6	ug/L	< 7.8 U	< 0.25 U	0.53 N		< 0.25 U	< 0.25 U	< 0.25 U	< 7.8 U			< 0.25 U	< 7.8 U	0.59 N
Malathion	121-75-5	ug/L	< 21 U	< 21 U	< 21 U		< 21 U	< 21 U	< 21 U	< 21 U			< 21 U	< 21 U	< 21 U
Methoxychlor	72-43-5	ug/L	< 11 U	< 0.075 U	< 0.075 U		< 11 U	< 0.075 U	< 0.075 U	< 0.075 U			< 0.075 U	< 0.075 U	< 11 U
Methoxychlor	72-43-5	ug/L	< 0.075 U	< 11 U	< 11 U		< 0.075 U	< 11 U	< 11 U	< 11 U			< 11 U	< 11 U	< 0.075 U
Methyl parathion	298-00-0	ug/L	< 0.5 U										< 0.5 U		
Mevinphos	7786-34-7	ug/L	< 2 U										< 2 U		
Mirex	2385-85-5	ug/L	< 24 U	< 24 U	< 24 U		< 24 U	< 24 U	< 24 U	< 24 U			< 24 U	< 24 U	< 24 U
Naled	300-76-5	ug/L	< 1 U										< 1 U		
Parathion	56-38-2	ug/L	< 37 U	< 37 U	< 37 U		< 37 U	< 37 U	< 37 U	< 37 U			< 37 U	< 37 U	< 37 U
p-Chlorophenylmethyl sulfide	123-09-1	ug/L	< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U	< 10 U			< 10 U	< 10 U	< 10 U
p-Chlorophenylmethyl sulfone	98-57-7	ug/L	< 5.3 U	< 5.3 U	< 5.3 U		< 5.3 U	< 5.3 U	< 5.3 U	< 5.3 U			< 5.3 U	< 5.3 U	< 5.3 U
p-Chlorophenylmethyl sulfoxide	934-73-6	ug/L	< 15 U	< 15 U	< 15 U		< 15 U	< 15 U	< 15 U	< 15 U			< 15 U	< 15 U	< 15 U
Phorate	298-02-2	ug/L	< 0.5 U										< 0.5 U		
Prothiophos	24643-46-4	ug/L	< 2 U										< 2 U		
Stirophos	961-11-5	ug/L	< 1 U										< 1 U		
Supona	470-90-6	ug/L	< 19 U	< 19 U	< 19 U		< 19 U	< 19 U	< 19 U	< 19 U			< 19 U	< 19 U	< 19 U
Toxaphene	8001-35-2	ug/L	< 1.64 U	< 1.64 U	< 1.64 U		< 8.5 U	< 1.64 U	< 1.64 U	< 1.64 U			< 1.64 U	< 1.64 U	< 1.64 U
Vapona	62-73-7	ug/L	< 8.5 U	< 8.5 U	< 8.5 U		< 8.5 U	< 8.5 U	< 8.5 U	< 8.5 U			< 0.5 U	< 8.5 U	< 8.5 U
Vapona	62-73-7	ug/L	< 0.5 U										< 8.5 U		

Table B-4
Historical Analytical Results for Groundwater at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118
		Location ID	D-I-2	D-I-2	D-I-2	D-I-2	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW-I	D-MW-I	D-MW-I
		Sample Date	10/24/1993	4/18/1994	7/18/1994	12/15/1997	4/18/1994	4/18/1994	7/18/1994	7/18/1994	12/12/1997	12/15/1997	10/24/1993	4/18/1994	7/18/1994
		Depth Interval	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	9 - 29	9 - 29	9 - 29
		Sample ID	I-2(19931024)	I-2(19940418)	I-2(19940718)	I-2(19971215)	MW118-1D(19940418)	MW118-1(19940418)	MW118-1D(19940718)	MW118-1(19940718)	MW118-1(19971212)	MW118-1(19971215)	MW-I(19931024)	MW-I(19940418)	MW-I(19940718)
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Chemical Name	CAS No	Unit													
SVOC															
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	< 1.5 U	< 1.5 U	< 1.5 U	< 1 U		< 1.5 U	< 1.5 U	< 1.5 U		< 1 U	< 1.5 U	< 1.5 U	< 1.5 U
1,2,4-Trichlorobenzene	120-82-1	ug/L	< 2.4 U	< 2.4 U	< 2.4 U		< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U			< 2.4 U	< 2.4 U	< 2.4 U
1,2-Dichlorobenzene	95-50-1	ug/L	< 1.2 U	< 1.2 U	< 1.2 U		< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U			< 1.2 U	< 1.2 U	< 1.2 U
1,2-Diphenylhydrazine	122-66-7	ug/L	< 13 U	< 13 U	< 13 U		< 13 U	< 13 U	< 13 U	< 13 U			< 13 U	< 13 U	< 13 U
1,3-Dichlorobenzene	541-73-1	ug/L	< 1 U	< 3.4 U	< 3.4 U		< 3.4 U	< 3.4 U	< 3.4 U	< 1 U			< 1 U	< 3.4 U	< 3.4 U
1,3-Dichlorobenzene	541-73-1	ug/L	< 3.4 U	< 1 U	< 1 U			< 1 U	< 1 U	< 3.4 U			< 3.4 U	< 1 U	< 1 U
1,4-Dichlorobenzene	106-46-7	ug/L	< 1.5 U	< 1.5 U	< 1.5 U		< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U			< 1.5 U	< 1.5 U	< 1.5 U
2,4,5-Trichlorophenol	95-95-4	ug/L	< 2.8 U	< 2.8 U	< 2.8 U		< 2.8 U	< 2.8 U	< 2.8 U	< 2.8 U			< 2.8 U	< 2.8 U	< 2.8 U
2,4,6-Trichlorophenol	88-06-2	ug/L	< 3.6 U	< 3.6 U	< 3.6 U		< 3.6 U	< 3.6 U	< 3.6 U	< 3.6 U			< 3.6 U	< 3.6 U	< 3.6 U
2,4-Dichlorophenol	120-83-2	ug/L	< 8.4 U	< 8.4 U	< 8.4 U		< 8.4 U	< 8.4 U	< 8.4 U	< 8.4 U			< 8.4 U	< 8.4 U	< 8.4 U
2,4-Dimethylphenol	105-67-9	ug/L	< 4.4 U	< 4.4 U	< 4.4 U		< 4.4 U	< 4.4 U	< 4.4 U	< 4.4 U			< 4.4 U	< 4.4 U	< 4.4 U
2,4-Dinitrophenol	51-28-5	ug/L	< 180 U	< 180 U	< 180 U		< 180 U	< 180 U	< 180 U	< 180 U			< 180 U	< 180 U	< 180 U
2,6-Dinitroaniline	606-22-4	ug/L	< 8.8 U	< 8.8 U	< 8.8 U		< 8.8 U	< 8.8 U	< 8.8 U	< 8.8 U			< 8.8 U	< 8.8 U	< 8.8 U
2-Chloronaphthalene	91-58-7	ug/L	< 2.6 U	< 2.6 U	< 2.6 U		< 2.6 U	< 2.6 U	< 2.6 U	< 2.6 U			< 2.6 U	< 2.6 U	< 2.6 U
2-Chlorophenol	95-57-8	ug/L	< 2.8 U	< 2.8 U	< 2.8 U		< 2.8 U	< 2.8 U	< 2.8 U	< 2.8 U			< 2.8 U	< 2.8 U	< 2.8 U
2-Methylnaphthalene	91-57-6	ug/L	< 1.3 U	< 1.3 U	< 1.3 U		< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U			< 1.3 U	< 1.3 U	< 1.3 U
2-Methylphenol	95-48-7	ug/L	< 3.6 U	< 3.6 U	< 3.6 U		< 3.6 U	< 3.6 U	< 3.6 U	< 3.6 U			< 3.6 U	< 3.6 U	< 3.6 U
2-Nitrophenol	88-75-5	ug/L	< 8.2 U	< 8.2 U	< 8.2 U		< 8.2 U	< 8.2 U	< 8.2 U	< 8.2 U			< 8.2 U	< 8.2 U	< 8.2 U
3,3'-Dichlorobenzidine	91-94-1	ug/L	< 5 U	< 5 U	< 5 U		< 5 U	< 5 U	< 5 U	< 5 U			< 5 U	< 5 U	< 5 U
3,5-Dinitroaniline	618-87-1	ug/L	< 21 U	< 21 U	< 21 U		< 21 U	< 21 U	< 21 U	< 21 U			< 21 U	< 21 U	< 21 U
3-Nitroaniline	99-09-2	ug/L	< 15 U	< 15 U	< 15 U		< 15 U	< 15 U	< 15 U	< 15 U			< 15 U	< 15 U	< 15 U
4-Bromophenyl phenyl ether	101-55-3	ug/L	< 22 U	< 22 U	< 22 U		< 22 U	< 22 U	< 22 U	< 22 U			< 22 U	< 22 U	< 22 U
4-Chloro-3-methylphenol	59-50-7	ug/L	< 8.5 U	< 8.5 U	< 8.5 U		< 8.5 U	< 8.5 U	< 8.5 U	< 8.5 U			< 8.5 U	< 8.5 U	< 8.5 U
4-Chlorophenyl phenyl ether	7005-72-3	ug/L	< 23 U	< 23 U	< 23 U		< 23 U	< 23 U	< 23 U	< 23 U			< 23 U	< 23 U	< 23 U
4-Methylphenol	106-44-5	ug/L	< 2.8 U#	< 2.8 U#	< 2.8 U#		< 2.8 U#	< 2.8 U#	< 2.8 U#	< 2.8 U#			< 2.8 U#	< 2.8 U#	< 2.8 U#
4-Nitrophenol	100-02-7	ug/L	< 96 U	< 96 U	< 96 U		< 96 U	< 96 U	< 96 U	< 96 U			< 96 U	< 96 U	< 96 U
Acenaphthene	83-32-9	ug/L	< 5.8 U	< 5.8 U	< 5.8 U		< 5.8 U	< 5.8 U	< 5.8 U	< 5.8 U			< 5.8 U	< 5.8 U	< 5.8 U
Acenaphthylene	208-96-8	ug/L	< 5.1 U	< 5.1 U	< 5.1 U		< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U			< 5.1 U	< 5.1 U	< 5.1 U
Anthracene	120-12-7	ug/L	< 5.2 U	< 5.2 U	< 5.2 U		< 5.2 U	< 5.2 U	< 5.2 U	< 5.2 U			< 5.2 U	< 5.2 U	< 5.2 U
Benz(a)anthracene	56-55-3	ug/L	< 9.8 U	< 9.8 U	< 9.8 U		< 9.8 U	< 9.8 U	< 9.8 U	< 9.8 U			< 9.8 U	< 9.8 U	< 9.8 U
Benzo(a)pyrene	50-32-8	ug/L	< 14 U	< 14 U	< 14 U		< 14 U	< 14 U	< 14 U	< 14 U			< 14 U	< 14 U	< 14 U
Benzo(b)fluoranthene	205-99-2	ug/L	< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U	< 10 U			< 10 U	< 10 U	< 10 U
Benzo(g,h,i)perylene	191-24-2	ug/L	< 15 U	< 15 U	< 15 U		< 15 U	< 15 U	< 15 U	< 15 U			< 15 U	< 15 U	< 15 U
Benzo(k)fluoranthene	207-08-9	ug/L	< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U	< 10 U			< 10 U	< 10 U	< 10 U
Benzyl alcohol	100-51-6	ug/L	< 4 U	< 4 U	< 4 U		< 4 U	< 4 U	< 4 U	< 4 U			< 4 U	< 4 U	< 4 U
bis(2-Chloroethoxy)methane	111-91-1	ug/L	< 6.8 U	< 6.8 U	< 6.8 U		< 6.8 U	< 6.8 U	< 6.8 U	< 6.8 U			< 6.8 U	< 6.8 U	< 6.8 U
bis(2-Chloroethyl)ether	111-44-4	ug/L	< 0.68 U	< 0.68 U	< 0.68 U		< 0.68 U	< 0.68 U	< 0.68 U	< 0.68 U			< 0.68 U	< 0.68 U	< 0.68 U
bis(2-Chloroisopropyl)ether	39638-32-9	ug/L	< 5 U	< 5 U	< 5 U		< 5 U	< 5 U	< 5 U	< 5 U			< 5 U	< 5 U	< 5 U
bis(2-Ethylhexyl)phthalate	117-81-7	ug/L	< 7.7 U	< 7.7 U	< 7.7 U		< 7.7 U	< 7.7 U	< 7.7 U	< 7.7 U			< 7.7 U	< 7.7 U	< 7.7 U
Butylbenzyl phthalate	85-68-7	ug/L	< 28 U	< 28 U	< 28 U		< 28 U	< 28 U	< 28 U	< 28 U			< 28 U	< 28 U	< 28 U
Chrysene	218-01-9	ug/L	< 7.4 U	< 7.4 U	< 7.4 U		< 7.4 U	< 7.4 U	< 7.4 U	< 7.4 U			< 7.4 U	< 7.4 U	< 7.4 U
Dibenz(a,h)anthracene	53-70-3	ug/L	< 12 U	< 12 U	< 12 U		< 12 U	< 12 U	< 12 U	< 12 U			< 12 U	< 12 U	< 12 U
Dibenzofuran	132-64-9	ug/L	< 5.1 U	< 5.1 U	< 5.1 U		< 5.1 U	< 5.1 U	< 5.1 U	< 5.1 U			< 5.1 U	< 5.1 U	< 5.1 U
Dichlorobenzenes	25321-22-6	ug/L	< 2 U	< 2 U	< 2 U			< 2 U	< 2 U	< 2 U			< 2 U	< 2 U	< 2 U
Dicyclopentadiene	77-73-6	ug/L	< 5.5 U	< 5.5 U	< 5.5 U		< 5.5 U	< 5.5 U	< 5.5 U	< 5.5 U			< 5.5 U	< 5.5 U	< 5.5 U
Diethylphthalate	84-66-2	ug/L	< 5.9 U	< 5.9 U	< 5.9 U		< 5.9 U	< 5.9 U	< 5.9 U	< 5.9 U			< 5.9 U	< 5.9 U	< 5.9 U
Dimethylphthalate	131-11-3	ug/L	< 2.2 U	< 2.2 U	< 2.2 U		< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U			< 2.2 U	< 2.2 U	< 2.2 U
di-n-Butylphthalate	84-74-2	ug/L	< 33 U	< 33 U	< 33 U		< 33 U	< 33 U	< 33 U	< 33 U			< 33 U	< 33 U	< 33 U
di-n-Octylphthalate	117-84-0	ug/L	< 1.5 U	< 1.5 U	< 1.5 U		< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U			< 1.5 U	< 1.5 U	< 1.5 U
Fluoranthene	206-44-0	ug/L	< 24 U	< 24 U	< 24 U		< 24 U	< 24 U	< 24 U	< 24 U			< 24 U	< 24 U	< 24 U
Fluorene	86-73-7	ug/L	< 9.2 U	< 9.2 U	< 9.2 U		< 9.2 U	< 9.2 U	< 9.2 U	< 9.2 U			< 9.2 U	< 9.2 U	< 9.2 U
Hexachlorobenzene	118-74-1	ug/L	< 12 U	< 12 U	< 12 U		< 12 U	< 12 U	< 12 U	< 12 U			< 12 U	< 12 U	< 12 U
Hexachlorobutadiene	87-68-3	ug/L	< 8.7 U	< 8.7 U	< 8.7 U		< 8.7 U	< 8.7 U	< 8.7 U	< 8.7 U			< 8.7 U	< 8.7 U	< 8.7 U
Hexachlorocyclopentadiene	77-47-4	ug/L	< 54 U	< 54 U	< 54 U		< 54 U	< 54 U	< 54 U	< 54 U			< 54 U	< 54 U	< 54 U
Hexachloroethane	67-72-1	ug/L	< 8.3 U	< 8.3 U	< 8.3 U		< 8.3 U	< 8.3 U	< 8.3 U	< 8.3 U			< 8.3 U	< 8.3 U	< 8.3 U
Indeno(1,2,3-c,d)pyrene	193-39-5	ug/L	< 21 U	< 21 U	< 21 U		< 21 U	< 21 U	< 21 U	< 21 U			< 21 U	< 21 U	< 21 U
Isophorone	78-59-1	ug/L	< 2.4 U	< 2.4 U	< 2.4 U		< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U			< 2.4 U	< 2.4 U	< 2.4 U
Naphthalene	91-20-3	ug/L	< 0.5 U	< 0.5 U	< 0.5 U		< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U			< 0.5 U	< 0.5 U	< 0.5 U
N-Nitrosodimethylamine	62-75-9	ug/L	< 9.7 U	< 9.7 U	< 9.7 U		< 9.7 U	< 9.7 U	< 9.7 U	< 9.7 U			< 9.7 U	< 9.7 U	< 9.7 U
n-Nitroso-di-n-propylamine	621-64-7	ug/L	< 6.8 U	< 6.8 U	< 6.8 U		< 6.8 U	< 6.8 U	< 6.8 U	< 6.8 U			< 6.8 U	< 6.8 U	< 6.8 U
n-Nitrosodiphenylamine	86-30-6	ug/L	< 3.7 U	< 3.7 U	< 3.7 U		< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U			< 3.7 U	< 3.7 U	< 3.7 U
Pentachlorophenol	87-86-5	ug/L	< 9.1 U	< 9.1 U	< 9.1 U		< 9.1 U	< 9.1 U	< 9.1 U	< 9.1 U			< 9.1 U	< 9.1 U	< 9.1 U
Phenanthrene	85-01-8	ug/L	< 9.9 U	< 9.9 U	< 9.9 U		< 9.9 U	< 9.9 U	< 9.9 U	< 9.9 U			< 9.9 U	< 9.9 U	< 9.9 U
Phenol	108-95-2	ug/L	< 2.2 U	< 2.2 U	< 2.2 U		< 2.2 U	< 2.2 U	< 2.2 U	< 2.2 U			< 2.2 U	< 2.2 U	< 2.2 U
Pyrene	129-00-0	ug/L	< 17 U	< 17 U	< 17 U		< 17 U	< 17 U	< 17 U	< 17 U			< 17 U	< 17 U	< 17 U

Table B-4
Historical Analytical Results for Groundwater at Site 118/PICA-097
Picatinny Arsenal, New Jersey

		Site Name	118	118	118	118	118	118	118	118	118	118	118	118	118
		Location ID	D-I-2	D-I-2	D-I-2	D-I-2	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW118-1	D-MW-I	D-MW-I	D-MW-I
		Sample Date	10/24/1993	4/18/1994	7/18/1994	12/15/1997	4/18/1994	4/18/1994	7/18/1994	7/18/1994	12/12/1997	12/15/1997	10/24/1993	4/18/1994	7/18/1994
		Depth Interval	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	31.8 - 36.8	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	9 - 29	9 - 29	9 - 29
		Sample ID	I-2(19931024)	I-2(19940418)	I-2(19940718)	I-2(19971215)	MW118-1D(19940418)	MW118-1(19940418)	MW118-1D(19940718)	MW118-1(19940718)	MW118-1(19971212)	MW118-1(19971215)	MW-I(19931024)	MW-I(19940418)	MW-I(19940718)
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Chemical Name	CAS No	Unit													
TPH															
Total Volatile Petroleum Hydrocarbons	TVPH	ug/L				< 200 U						< 200 U			
VOC															
1,1,1-Trichloroethane	71-55-6	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/L				< 1 U						< 1 U			
1,1,2-Trichloroethane	79-00-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
1,1-Dichloroethane	75-34-3	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
1,1-Dichloroethene	75-35-4	ug/L	< 1 U	< 1 U	< 1 U	< 2 U		< 1 U	< 1 U	< 1 U		< 2 U	< 1 U	< 1 U	< 1 U
1,2,3-Trichlorobenzene	87-61-6	ug/L	< 5.8 U	< 5.8 U	< 5.8 U		< 5.8 U	< 5.8 U	< 5.8 U	< 5.8 U			< 5.8 U	< 5.8 U	< 5.8 U
1,2-Dichloroethane	107-06-2	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
1,2-Dichloroethene (total)	540-59-0	ug/L	< 5 U	< 5 U	< 5 U			< 5 U	< 5 U	< 5 U			< 5 U	< 5 U	< 5 U
1,2-Dichloropropane	78-87-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
1,3-Dichloropropane	142-28-9	ug/L	< 4.8 U	< 4.8 U	< 4.8 U			< 4.8 U	< 4.8 U	< 4.8 U			< 4.8 U	< 4.8 U	< 4.8 U
2,3,6-Trichlorophenol	933-75-5	ug/L	< 1.7 U	< 1.7 U	< 1.7 U		< 1.7 U	< 1.7 U	< 1.7 U	< 1.7 U			< 1.7 U	< 1.7 U	< 1.7 U
2-Butanone	78-93-3	ug/L	< 10 U	< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U		< 10 U	< 10 U	< 10 U	< 10 U
2-Chloroethyl vinyl ether	110-75-8	ug/L	< 3.5 U	< 3.5 U	< 3.5 U			< 3.5 U	< 3.5 U	< 3.5 U			< 3.5 U	< 3.5 U	< 3.5 U
2-Hexanone	591-78-6	ug/L				< 10 U						< 10 U			
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	< 1.4 U	< 1.4 U	< 1.4 U	< 10 U		< 1.4 U	< 1.4 U	< 1.4 U		< 10 U	< 1.4 U	< 1.4 U	< 1.4 U
Acetone	67-64-1	ug/L	< 8 U	< 8 U	< 8 U	< 10 U		< 8 U	< 8 U	< 8 U		< 10 U	< 8 U	< 8 U	< 8 U
Acrylonitrile	107-13-1	ug/L	< 8.4 U	< 8.4 U	< 8.4 U			< 8.4 U	< 8.4 U	< 8.4 U			< 8.4 U	< 8.4 U	< 8.4 U
Benzene	71-43-2	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Bromodichloromethane	75-27-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Bromoform	75-25-2	ug/L	< 11 U	< 11 U	< 11 U	< 1 U		< 11 U	< 11 U	< 11 U		< 1 U	< 11 U	< 11 U	< 11 U
Bromomethane	74-83-9	ug/L	< 14 U	< 14 U	< 14 U	< 1 U		< 14 U	< 14 U	< 14 U		< 1 U	< 14 U	< 14 U	< 14 U
Carbon disulfide	75-15-0	ug/L				< 2 U						< 2 U			
Carbon tetrachloride	56-23-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Chlorobenzene	108-90-7	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Chloroethane	75-00-3	ug/L	< 8 U	< 8 U	< 8 U	< 1 U		< 8 U	< 8 U	< 8 U		< 1 U	< 8 U	< 8 U	< 8 U
Chloroform	67-66-3	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		0.92 J	< 1 U	< 1 U	< 1 U
Chloromethane	74-87-3	ug/L	< 1.2 U	< 1.2 U	< 1.2 U	< 1 U		< 1.2 U	< 1.2 U	< 1.2 U		< 1 U	< 1.2 U	< 1.2 U	< 1.2 U
cis-1,2-Dichloroethene	156-59-2	ug/L				< 1 U						< 1 U			
cis-1,3-Dichloropropene	10061-01-5	ug/L				< 1 U						< 1 U			
Dibromochloromethane	124-48-1	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Dibromochloropropane	96-12-8	ug/L	< 12 U	< 12 U	< 12 U		< 12 U	< 12 U	< 12 U	< 12 U			< 12 U	< 12 U	< 12 U
Dichlorodifluoromethane	75-71-8	ug/L				< 1 U						< 1 U			
Ethyl benzene	100-41-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Methylene chloride	75-09-2	ug/L	< 1 U	< 1 U	< 1 U	1.42		< 1 U	< 1 U	< 1 U		1.31	< 1 U	< 1 U	< 1 U
m-Xylenes	108-38-3	ug/L	< 1 U	< 1 U	< 1 U			< 1 U	< 1 U	< 1 U			< 1 U	< 1 U	< 1 U
Styrene	100-42-5	ug/L				< 1 U						< 1 U			
Tetrachloroethene	127-18-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Toluene	108-88-3	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
trans-1,2-Dichloroethene	156-60-5	ug/L				< 1 U						< 1 U			
trans-1,3-Dichloropropene	10061-02-6	ug/L				< 1 U						< 1 U			
Trichloroethene	79-01-6	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		8.6	7.8	7.8		6.5	3.5	5.1	3.9
Trichlorofluoromethane	75-69-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U		< 1 U	< 1 U	< 1 U	< 1 U
Vinyl chloride	75-01-4	ug/L	< 12 U	< 12 U	< 12 U	< 1 U		< 12 U	< 12 U	< 12 U		< 1 U	< 12 U	< 12 U	< 12 U
Xylenes	1330-20-7	ug/L	< 2 U	< 2 U	< 2 U	< 2 U		< 2 U	< 2 U	< 2 U		< 2 U	< 2 U	< 2 U	< 2 U
WetChem															
Alkalinity, Total	Alkalinity	ug/L				68000						160000			
Ammonia	7664-41-7	ug/L				< 50 U						< 50 U			
Chloride	16887-00-6	ug/L				80000						55000			
Cyanide	57-12-5	ug/L	< 5 U	< 5 U	< 5 U		< 5 U	< 5 U	< 5 U	< 5 U			< 5 U	< 5 U	< 5 U
Dissolved Organic Carbon	DOC	ug/L				< 1000 U						< 1000 U			
Dissolved Oxygen	DO	ug/L				1500						2300			
Ferrous Iron	Fe2+	ug/L				560						< 100 U			
Nitrate	14797-55-8	ug/L				< 100 U						1300			
Nitrite	14797-65-0	ug/L				< 1 U						9.4			
pH	pH	No Unit				7.36						7.59			
Sulfate	14808-79-8	ug/L				36000						15000			
Sulfide	18496-25-8	ug/L				11						12			

Table B-5
Historical Analytical Results for Soil at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-MW-001	H-131-MW-001	131-MW-002	H-131-MW-002	H-131-MW-002	H-131-MW-002	H-131-MW-003	H-131-MW-003	H-131-SB-001	H-131-SB-002	H-131-SS-001A	H-131-SS-002A	H-131-SS-003A	H-131-SS-004C
		Sample Date	7/17/1996	7/17/1996	1/4/1996	1/4/1996	1/5/1996	1/5/1996	6/6/1996	6/6/1996	12/5/2000	12/5/2000	12/7/1995	12/7/1995	4/1/1996	3/25/1996
		Depth Interval	5 - 7	10 - 12	1 - 3	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	2 - 3	2 - 3	0 - 1	0 - 1	0 - 1	0 - 1
		Sample ID	131MW-1B(5-7)	131MW-1C(10-12)	131MW-2A(1-3)	131MW-2B(5-7)	131MW-2C(10-12)	131MW-2CDUP(10-12)	131MW-3C(10-12)	131MW-3B(5-7)	131SB-1B(2-3)	131SB-2B(2-3)	131SS-1A(0-1)	131SS-2A(0-1)	131SS-3A(0-1)	131SS-4C(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit														
Explosives																
1,3,5-Trinitrobenzene	99-35-4	mg/kg	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U			< 0.488 U	< 0.488 U		
1,3-Dinitrobenzene	99-65-0	mg/kg	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U			< 0.496 U	< 0.496 U		
2,4,6-Trinitrotoluene	118-96-7	mg/kg	< 0.456 U	< 0.456 U	< 0.456 U	< 0.456 U	< 0.456 U	< 0.456 U	< 0.456 U	< 0.456 U			< 0.456 U	< 0.456 U		
HMX	2691-41-0	mg/kg	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U			< 0.666 U	< 0.666 U		
Nitrobenzene	98-95-3	mg/kg	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U			< 2.41 U	< 2.41 U		
Nitrocellulose	9004-70-0	mg/kg			< 10.4 UJ	< 10.4 UJ	< 10.4 UJ	< 10.4 UJ	< 10.4 U	< 10.4 U			< 10.4 U	29.8		
Nitroglycerin	55-63-0	mg/kg	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U			< 4 U	< 4 U		
Nitroguanidine	556-88-7	mg/kg	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U			< 0.475 U	0.57		
PETN	78-11-5	mg/kg	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U			< 4 U	< 4 U		
Picric Acid	88-89-1	mg/kg	< 0.108 U	< 0.108 U	< 0.108 UJ	< 0.108 UJ	< 0.108 UJ	< 0.108 UJ	< 0.108 U	< 0.108 U			< 0.108 U	< 0.108 U		
RDX	121-82-4	mg/kg	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U			< 0.587 U	< 0.587 U		
Tetrazene	14097-21-3	mg/kg	< 1.19 U	< 1.19 U	3.08	2.5	2.66	2.39	< 1.19 R	< 1.19 R			< 1.19 R	< 1.19 R		
Tetryl	479-45-8	mg/kg	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U			< 0.731 U	< 0.731 U		
Explosives / SVOC																
2,4-Dinitrotoluene	121-14-2	mg/kg	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U			< 0.424 U	< 0.424 U		
2,6-Dinitrotoluene	606-20-2	mg/kg	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U			< 0.524 U	< 0.524 U		
Metals																
Aluminum	7429-90-5	mg/kg	5160	787	5390	3460	4440	4070	3970	3810			10300	10500		
Antimony	7440-36-0	mg/kg	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U			0.25	0.26		
Arsenic	7440-38-2	mg/kg	5.97	1.22	8.44	9.55	4.82	4.71	5.49	4.68	11.5	23.5	24.9	43		
Barium	7440-39-3	mg/kg	32	< 5.18 U	38.8	23.1	22.2	30	27.3	13.6			42.6	152		
Beryllium	7440-41-7	mg/kg	0.66	< 0.5 U	< 0.5 U	0.62	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U			1.38	1.02		
Boron	7440-42-8	mg/kg	8.49	< 5.91 U	7.82	< 5.91 U	< 5.91 U	< 5.91 U	13.9	7.51			10.1	9.31		
Cadmium	7440-43-9	mg/kg	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U			< 0.7 U	< 0.7 U		
Calcium	7440-70-2	mg/kg	1010	419	3460	329	327	294	321	722			3310	1530		
Chromium	7440-47-3	mg/kg	46.1	53.1	11.8	20.9	7.76	10.3	25.2	9.41			14.6	26.6		
Cobalt	7440-48-4	mg/kg	19.3	3.16	20.3	20.6	7.39	11.6	12.3	6.42			16.9	5.94		
Copper	7440-50-8	mg/kg	24	5.27	31.3	28.3	19	26.4	17.9	14.3			43.3	475		
Iron	7439-89-6	mg/kg	14100	2550	14700	13000	14000	13300	12800	9850			22000	21000		
Lead	7439-92-1	mg/kg	16.3	2.67	32.4	18.7	11.8	11.4	9.33	9.62			43.5	326		
Magnesium	7439-95-4	mg/kg	1170	270	2120	662	1410	1190	918	760			3290	1160		
Manganese	7439-96-5	mg/kg	930	92.5	591	861	310	871	626	199			548	141		
Mercury	7439-97-6	mg/kg	< 0.05 U	< 0.05 U	0.17	< 0.05 U	< 0.05 U	< 0.05 U	< 0.05 U	0.1			2.1	4.6		
Nickel	7440-02-0	mg/kg	15.5	4.15	12.9	13.3	14.1	15	17.8	6.84			20.8	14.6		
Potassium	7440-09-7	mg/kg	577	222	692	415	427	358	648	346			909	364		
Selenium	7782-49-2	mg/kg	0.53	< 0.25 U	0.43	< 0.25 U	< 0.25 U	0.33	0.45	0.48			< 0.25 U	0.38		
Silver	7440-22-4	mg/kg	0.74	< 0.589 U	< 0.589 U	0.63	< 0.589 U	< 0.589 U	< 0.589 U	< 0.589 U			< 0.589 U	< 0.589 U		
Sodium	7440-23-5	mg/kg	508	395	598	386	348	272	570	359			400	495		
Strontium	7440-24-6	mg/kg	10.2	< 2.5 U	29 J	18.1 J	9.21 J	10.1 J	4.49	8.79			16.2 J	11.9 J		
Thallium	7440-28-0	mg/kg	< 0.1 U	< 0.1 U	0.15	< 0.1 U	0.25	< 0.1 U	< 0.1 U	< 0.1 U			0.38	0.19		
Titanium	7440-32-6	mg/kg	205	< 50 U	279	150	79.3	73.6	< 50 U	103			347	214		
Vanadium	7440-62-2	mg/kg	12.6	< 3.39 U	17.6	16.1	11.5	12.8	13.2	13.5			25.2	21.6		
Zinc	7440-66-6	mg/kg	38.7	10.9	55.7	31.5	36.9	36.5	50.1	18.7			85.1	387		
Zirconium	7440-67-7	mg/kg	8.82	< 2.5 U	9.64	14.8	9.7	10.3	8.31	11.1			19.2	5.74		
PCBs																
Aroclor 1016	12674-11-2	mg/kg													< 0.0666 U	< 0.0666 U
Aroclor 1221	11104-28-2	mg/kg													< 0.082 UT	< 0.082 UT
Aroclor 1232	11141-16-5	mg/kg													< 0.082 UT	< 0.082 UT
Aroclor 1242	53469-21-9	mg/kg													< 0.082 UT	< 0.082 UT
Aroclor 1248	12672-29-6	mg/kg													< 0.082 UT	< 0.082 UT
Aroclor 1254	11097-69-1	mg/kg													< 0.082 UT	< 0.082 UT
Aroclor 1260	11096-82-5	mg/kg													< 0.0804 U	< 0.0804 U
Pesticides																
Mirex	2385-85-5	mg/kg	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U			< 0.25 U	< 0.25 U		

Table B-5
Historical Analytical Results for Soil at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-MW-001	H-131-MW-001	H-131-MW-002	H-131-MW-002	H-131-MW-002	H-131-MW-002	H-131-MW-003	H-131-MW-003	H-131-SB-001	H-131-SB-002	H-131-SS-001A	H-131-SS-002A	H-131-SS-003A	H-131-SS-004C
		Sample Date	7/17/1996	7/17/1996	1/4/1996	1/4/1996	1/5/1996	1/5/1996	6/6/1996	6/6/1996	12/5/2000	12/5/2000	12/7/1995	12/7/1995	4/1/1996	3/25/1996
		Depth Interval	5 - 7	10 - 12	1 - 3	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	2 - 3	2 - 3	0 - 1	0 - 1	0 - 1	0 - 1
		Sample ID	131MW-1B(5-7)	131MW-1C(10-12)	131MW-2A(1-3)	131MW-2B(5-7)	131MW-2C(10-12)	131MW-2CDUP(10-12)	131MW-3C(10-12)	131MW-3B(5-7)	131SB-1B(2-3)	131SB-2B(2-3)	131SS-1A(0-1)	131SS-2A(0-1)	131SS-3A(0-1)	131SS-4C(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit														
SVOC																
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U			< 0.24 U	< 0.24 U		
1,2,4-Trichlorobenzene	120-82-1	mg/kg	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U			< 0.04 U	< 0.04 U		
1,2-Dichlorobenzene	95-50-1	mg/kg	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U			< 0.11 U	< 0.11 U		
1,3-Dichlorobenzene	541-73-1	mg/kg	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U			< 0.13 U	< 0.13 U		
1,4-Dichlorobenzene	106-46-7	mg/kg	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U			< 0.098 U	< 0.098 U		
2,4,5-Trichlorophenol	95-95-4	mg/kg	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U			< 0.1 U	< 0.1 U		
2,4,6-Trichlorophenol	88-06-2	mg/kg	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U			< 0.17 U	< 0.17 U		
2,4-Dichlorophenol	120-83-2	mg/kg	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U			< 0.18 U	< 0.18 U		
2,4-Dimethylphenol	105-67-9	mg/kg	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U			< 0.69 U	< 0.69 U		
2,4-Dinitrophenol	51-28-5	mg/kg	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U			< 1.2 U	< 1.2 U		
2-Chloronaphthalene	91-58-7	mg/kg	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U			< 0.036 U	< 0.036 U		
2-Chlorophenol	95-57-8	mg/kg	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U			< 0.06 U	< 0.06 U		
2-Methylnaphthalene	91-57-6	mg/kg	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U			< 0.049 U	< 0.049 U		
2-Methylphenol	95-48-7	mg/kg	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U			< 0.029 U	< 0.029 U		
2-Nitroaniline	88-74-4	mg/kg	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U			< 0.062 U	< 0.062 U		
2-Nitrophenol	88-75-5	mg/kg	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U			< 0.14 U	< 0.14 U		
3,3'-Dichlorobenzidine	91-94-1	mg/kg	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U			< 6.3 U	< 6.3 U		
3-Nitroaniline	99-09-2	mg/kg	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U			< 0.45 U	< 0.45 U		
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U			< 0.55 U	< 0.55 U		
4-Bromophenyl phenyl ether	101-55-3	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U			< 0.033 U	< 0.033 U		
4-Chloro-3-methylphenol	59-50-7	mg/kg	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U			< 0.095 U	< 0.095 U		
4-Chloroaniline	106-47-8	mg/kg	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U			< 0.81 U	< 0.81 U		
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U			< 0.033 U	< 0.033 U		
4-Methylphenol	106-44-5	mg/kg	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#			< 0.24 U#	< 0.24 U#		
4-Nitroaniline	100-01-6	mg/kg	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U			< 0.41 U	< 0.41 U		
4-Nitrophenol	100-02-7	mg/kg	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U			< 1.4 U	< 1.4 U		
Acenaphthene	83-32-9	mg/kg	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.39 U	< 0.41 U	< 0.036 U	< 0.036 U		
Acenaphthylene	208-96-8	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.39 U	< 0.41 U	< 0.033 U	< 0.033 U		
Aniline	62-53-3	mg/kg	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U			< 0.65 U	< 0.65 U		
Anthracene	120-12-7	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.39 U	< 0.41 U	< 0.033 U	< 0.033 U		
Benz(a)anthracene	56-55-3	mg/kg	< 0.17 U	< 0.17 U	0.2	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.39 U	< 0.41 U	< 0.17 U	< 0.17 U		
Benzo(a)pyrene	50-32-8	mg/kg	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.39 U	< 0.41 U	< 0.25 U	< 0.25 U		
Benzo(b)fluoranthene	205-99-2	mg/kg	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	0.07 J	< 0.41 U	< 0.21 U	< 0.21 U		
Benzo(g,h,i)perylene	191-24-2	mg/kg	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.39 U	< 0.41 U	< 0.25 U	< 0.25 U		
Benzo(k)fluoranthene	207-08-9	mg/kg	< 0.066 U	< 0.066 U	0.26	< 0.066 U	< 0.066 U	< 0.066 U	< 0.066 U	< 0.066 U	< 0.39 U	< 0.41 U	< 0.066 U	< 0.066 U		
Benzyl alcohol	100-51-6	mg/kg	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U			< 0.19 U	< 0.19 U		
bis(2-Chloroethoxy)methane	111-91-1	mg/kg	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U			< 0.059 U	< 0.059 U		
bis(2-Chloroethyl)ether	111-44-4	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U			< 0.033 U	< 0.033 U		
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U			< 0.2 U	< 0.2 U		
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U			< 0.62 U	< 0.62 U		
Butylbenzyl phthalate	85-68-7	mg/kg	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U			< 0.17 U	< 0.17 U		
Carbazole	86-74-8	mg/kg	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U			< 0.14 U	< 0.14 U		
Chrysene	218-01-9	mg/kg	< 0.12 U	< 0.12 U	0.36	< 0.12 U	< 0.12 U	< 0.12 U	< 0.12 U	< 0.12 U	0.09 J	< 0.41 U	< 0.12 U	< 0.12 U		
Dibenz(a,h)anthracene	53-70-3	mg/kg	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.39 U	< 0.41 U	< 0.21 U	< 0.21 U		
Dibenzofuran	132-64-9	mg/kg	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U			< 0.035 U	< 0.035 U		
Diethylphthalate	84-66-2	mg/kg	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U			< 0.24 U	< 0.24 U		
Dimethylphthalate	131-11-3	mg/kg	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U			< 0.17 U	< 0.17 U		
di-n-Butylphthalate	84-74-2	mg/kg	< 0.061 U	< 0.061 U	< 0.061 U	< 0.061 U	< 0.061 U	< 0.061 U	< 0.061 U	< 0.061 U			< 0.061 U	< 0.061 U		
di-n-Octylphthalate	117-84-0	mg/kg	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U			< 0.19 U	< 0.19 U		
Diphenylamine	122-39-4	mg/kg	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U			< 0.13 U	< 0.13 U		
Fluoranthene	206-44-0	mg/kg	< 0.068 U	< 0.068 U	0.51	< 0.068 U	< 0.068 U	< 0.068 U	< 0.068 U	< 0.068 U	0.15 J	< 0.41 U	< 0.068 U	1		
Fluorene	86-73-7	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.39 U	< 0.41 U	< 0.033 U	< 0.033 U		
Hexachlorobenzene	118-74-1	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U			< 0.033 U	< 0.033 U		
Hexachlorobutadiene	87-68-3	mg/kg	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U			< 0.23 U	< 0.23 U		
Hexachlorocyclopentadiene	77-47-4	mg/kg	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U			< 6.2 U	< 6.2 U		
Hexachloroethane	67-72-1	mg/kg	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U			< 0.15 U	< 0.15 U		
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.39 U	< 0.41 U	< 0.29 U	< 0.29 U		
Isophorone	78-59-1	mg/kg	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U			< 0.033 U	< 0.033 U		
Naphthalene	91-20-3	mg/kg	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.39 U	< 0.41 U	< 0.037 U	< 0.037 U		
n-Nitroso-di-n-propylamine	621-64-7	mg/kg	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U			< 0.2 U	< 0.2 U		
n-Nitrosodiphenylamine	86-30-6	mg/kg	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U			< 0.19 U	< 0.19 U		
Pentachlorophenol	87-86-5	mg/kg	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U			< 1.3 U	< 1.3 U		
Phenanthrene	85-01-8	mg/kg	< 0.033 U	< 0.033 U	0.17	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	0.12 J	< 0.41 U	< 0.033 U	0.5		
Phenol	108-95-2	mg/kg	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U			< 0.11 U	< 0.11 U		
Pyrene	129-00-0	mg/kg	< 0.033 U	< 0.033 U	0.45	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	0.12 J	< 0.41 U	0.07	1		

Table B-5
Historical Analytical Results for Soil at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-MW-001	H-131-MW-001	H-131-MW-002	H-131-MW-002	H-131-MW-002	H-131-MW-002	H-131-MW-003	H-131-MW-003	H-131-SB-001	H-131-SB-002	H-131-SS-001A	H-131-SS-002A	H-131-SS-003A	H-131-SS-004C
		Sample Date	7/17/1996	7/17/1996	1/4/1996	1/4/1996	1/5/1996	1/5/1996	6/6/1996	6/6/1996	12/5/2000	12/5/2000	12/7/1995	12/7/1995	4/1/1996	3/25/1996
		Depth Interval	5 - 7	10 - 12	1 - 3	5 - 7	10 - 12	10 - 12	10 - 12	5 - 7	2 - 3	2 - 3	0 - 1	0 - 1	0 - 1	0 - 1
		Sample ID	131MW-1B(5-7)	131MW-1C(10-12)	131MW-2A(1-3)	131MW-2B(5-7)	131MW-2C(10-12)	131MW-2CDUP(10-12)	131MW-3C(10-12)	131MW-3B(5-7)	131SB-1B(2-3)	131SB-2B(2-3)	131SS-1A(0-1)	131SS-2A(0-1)	131SS-3A(0-1)	131SS-4C(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit														
TPH																
Diesel Fuel	68334-30-5	mg/kg	< 8.24 U	< 8.24 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8.24 U	< 8.24 U			< 8 U	< 8 U		
Gasoline range organics	GRO	mg/kg	< 8.3 U	< 8.3 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8.3 U	< 8.3 U			< 8 U	< 8 U		
TPH, aviation gas fraction	50815-00-4	mg/kg	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U	< 8 U			< 8 U	< 8 U		
TRPH	TRPH	mg/kg	< 27.8 U	129												
VOC																
1,1,1-Trichloroethane	71-55-6	mg/kg	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U			< 0.44 U	< 0.44 U		
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	mg/kg	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U			< 0.82 U	< 0.82 U		
1,1,2-Trichloroethane	79-00-5	mg/kg	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U			< 0.54 U	< 0.54 U		
1,1-Dichloroethane	75-34-3	mg/kg	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U			< 0.23 U	< 0.23 U		
1,1-Dichloroethene	75-35-4	mg/kg	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U			< 0.39 U	< 0.39 U		
1,2-Dichloroethane	107-06-2	mg/kg	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U			< 0.17 U	< 0.17 U		
1,2-Dichloroethene (total)	540-59-0	mg/kg	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U			< 0.3 U	< 0.3 U		
1,2-Dichloropropane	78-87-5	mg/kg	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U			< 0.29 U	< 0.29 U		
2-Butanone	78-93-3	mg/kg	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U			< 0.07 U	< 0.07 U		
2-Hexanone	591-78-6	mg/kg	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U			< 0.032 U	< 0.032 U		
4-Methyl-2-pentanone (MIBK)	108-10-1	mg/kg	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U			< 0.027 U	< 0.027 U		
Acetone	67-64-1	mg/kg	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U			< 0.017 U	< 0.017 U		
Acetonitrile	75-05-8	mg/kg	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U			< 0.23 U	< 0.23 U		
Benzene	71-43-2	mg/kg	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U			< 0.15 U	< 0.15 U		
Bromodichloromethane	75-27-4	mg/kg	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U			< 0.29 U	< 0.29 U		
Bromoform	75-25-2	mg/kg	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U			< 0.69 U	< 0.69 U		
Bromomethane	74-83-9	mg/kg	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U			< 0.57 U	< 0.57 U		
Carbon disulfide	75-15-0	mg/kg	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U			< 0.44 U	< 0.44 U		
Carbon tetrachloride	56-23-5	mg/kg	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U			< 0.7 U	< 0.7 U		
Chlorobenzene	108-90-7	mg/kg	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U			< 0.086 U	< 0.086 U		
Chloroethane	75-00-3	mg/kg	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U			< 0.012 U	< 0.012 U		
Chloroform	67-66-3	mg/kg	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U			< 0.087 U	< 0.087 U		
Chloromethane	74-87-3	mg/kg	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U			< 0.88 U	< 0.88 U		
cis-1,3-Dichloropropene	10061-01-5	mg/kg	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U			< 0.32 U	< 0.32 U		
Dibromochloromethane	124-48-1	mg/kg	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U			< 0.31 U	< 0.31 U		
Dichlorodifluoromethane	75-71-8	mg/kg	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U			< 0.014 U	< 0.014 U		
Ethanol	64-17-5	mg/kg	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U			< 3.7 U	< 3.7 U		
Ethyl benzene	100-41-4	mg/kg	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U			< 0.17 U	< 0.17 U		
Ethylene Oxide	75-21-8	mg/kg											< 0.3 U	< 0.3 U		
Isopropanol	67-63-0	mg/kg	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U			< 0.79 U	< 0.79 U		
Methylene chloride	75-09-2	mg/kg	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U			< 0.012 U	< 0.012 U		
Styrene	100-42-5	mg/kg	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U			< 0.26 U	< 0.26 U		
tert-Butylalcohol	75-65-0	mg/kg	< 0.5 U	< 0.5 U	< 1 U	< 1 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U			< 1 U	< 1 U		
Tetrachloroethene	127-18-4	mg/kg	< 0.081 U	< 0.081 U	< 0.081 U	< 0.081 U	< 0.081 U	< 0.081 U	< 0.081 U	< 0.081 U			< 0.081 U	< 0.081 U		
Toluene	108-88-3	mg/kg	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U			< 0.078 U	< 0.078 U		
trans-1,3-Dichloropropene	10061-02-6	mg/kg	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U			< 0.28 U	< 0.28 U		
Trichloroethene	79-01-6	mg/kg	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U			< 0.28 U	< 0.28 U		
Trichlorofluoromethane	75-69-4	mg/kg	0.85	0.01	< 0.59 U	< 0.59 U	< 0.59 U	< 0.59 U	< 0.59 U	< 0.59 U			< 0.59 U	0.01		
Vinyl acetate	108-05-4	mg/kg	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U			< 0.032 U	< 0.032 U		
Vinyl chloride	75-01-4	mg/kg	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U			< 0.62 U	< 0.62 U		
Xylenes	1330-20-7	mg/kg	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U			< 0.15 U	< 0.15 U		
WetChem																
% Solids	%Solid	%									85.4	81.5				
Ammonia	7664-41-7	mg/kg	< 12.5 U	< 12.5 U	20.7	< 12.5 U	< 12.5 U	18.7	< 12.5 U	< 12.5 U			70.7	143		
Chloride	16887-00-6	mg/kg	< 6.05 U	< 6.05 U	17.8	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U			< 6.05 U	< 6.05 U		
Cyanide	57-12-5	mg/kg	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U			< 0.92 U	< 0.92 U		
Fluoride	16984-48-8	mg/kg	< 3.62 U	< 3.62 U	5.91	7.37	4.77	6.32	7.15	4.77			< 3.62 U	5.34		
Nitrate/Nitrite	Nitrate/Nitrite	mg/kg	< 0.6 U	< 0.6 U	< 0.6 U	< 0.6 U	< 0.6 U	< 0.6 U	< 0.6 U	< 0.6 U			2.43	< 0.6 U		
Phosphate	14265-44-2	mg/kg	630	< 7.49 U	720	270	200	260	240	< 7.49 U			230	370		
Sulfate	14808-79-8	mg/kg	< 90.4 U	< 90.4 U	< 90.4 U	< 90.4 U	< 90.4 U	< 90.4 U	< 90.4 U	< 90.4 U			< 90.4 U	< 90.4 U		
Sulfide	18496-25-8	mg/kg	< 6 U	< 6 U	< 6 U	< 6 U	< 6 U	< 6 U	< 6 U	< 6 U			< 6 U	< 6 U		

Table B-5
Historical Analytical Results for Soil at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-SS-005C	H-131-SS-006	H-131-SS-007	H-131-SS-008	H-131-SS-008	H-131-SS-009	H-131-SS-010A	H-131-SS-011	H-131-SS-012	H-131-SS-013
		Sample Date	12/7/1995	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000
		Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
		Sample ID	131SS-5C(0-1)	131SS-6A(0-1)	131SS-7A(0-1)	131SS-8A(0-1)	131SS-8ADUP(0-1)	131SS-9A(0-1)	131SS-10A(0-1)	131SS-11A(0-1)	131SS-12A(0-1)	131SS-13A(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit										
Explosives												
1,3,5-Trinitrobenzene	99-35-4	mg/kg	< 0.488 U									
1,3-Dinitrobenzene	99-65-0	mg/kg	< 0.496 U									
2,4,6-Trinitrotoluene	118-96-7	mg/kg	< 0.456 U									
HMX	2691-41-0	mg/kg	< 0.666 U									
Nitrobenzene	98-95-3	mg/kg	< 2.41 U									
Nitrocellulose	9004-70-0	mg/kg	< 10.4 U									
Nitroglycerin	55-63-0	mg/kg	< 4 U									
Nitroguanidine	556-88-7	mg/kg	< 0.475 U									
PETN	78-11-5	mg/kg	< 4 U									
Picric Acid	88-89-1	mg/kg	< 0.108 U									
RDX	121-82-4	mg/kg	< 0.587 U									
Tetrazene	14097-21-3	mg/kg	< 1.19 R									
Tetryl	479-45-8	mg/kg	< 0.731 U									
Explosives / SVOC												
2,4-Dinitrotoluene	121-14-2	mg/kg	< 0.424 U									
2,6-Dinitrotoluene	606-20-2	mg/kg	< 0.524 U									
Metals												
Aluminum	7429-90-5	mg/kg	7250									
Antimony	7440-36-0	mg/kg	0.37									
Arsenic	7440-38-2	mg/kg	97	55.6	69.2	81.1	83.6	59.7	13.7	59.2	126	1440 D
Barium	7440-39-3	mg/kg	77									
Beryllium	7440-41-7	mg/kg	0.62									
Boron	7440-42-8	mg/kg	8.65									
Cadmium	7440-43-9	mg/kg	0.98									
Calcium	7440-70-2	mg/kg	11000									
Chromium	7440-47-3	mg/kg	16.2									
Cobalt	7440-48-4	mg/kg	18.2									
Copper	7440-50-8	mg/kg	34.8									
Iron	7439-89-6	mg/kg	16100									
Lead	7439-92-1	mg/kg	117									
Magnesium	7439-95-4	mg/kg	5990									
Manganese	7439-96-5	mg/kg	845									
Mercury	7439-97-6	mg/kg	2.1									
Nickel	7440-02-0	mg/kg	15.6									
Potassium	7440-09-7	mg/kg	517									
Selenium	7782-49-2	mg/kg	< 0.25 U									
Silver	7440-22-4	mg/kg	< 0.589 U									
Sodium	7440-23-5	mg/kg	412									
Strontium	7440-24-6	mg/kg	55 J									
Thallium	7440-28-0	mg/kg	0.15									
Titanium	7440-32-6	mg/kg	361									
Vanadium	7440-62-2	mg/kg	21.3									
Zinc	7440-66-6	mg/kg	114									
Zirconium	7440-67-7	mg/kg	13.4									
PCBs												
Aroclor 1016	12674-11-2	mg/kg										
Aroclor 1221	11104-28-2	mg/kg										
Aroclor 1232	11141-16-5	mg/kg										
Aroclor 1242	53469-21-9	mg/kg										
Aroclor 1248	12672-29-6	mg/kg										
Aroclor 1254	11097-69-1	mg/kg										
Aroclor 1260	11096-82-5	mg/kg										
Pesticides												
Mirex	2385-85-5	mg/kg	< 0.25 U									

Table B-5
Historical Analytical Results for Soil at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-SS-005C	H-131-SS-006	H-131-SS-007	H-131-SS-008	H-131-SS-008	H-131-SS-009	H-131-SS-010A	H-131-SS-011	H-131-SS-012	H-131-SS-013
		Sample Date	12/7/1995	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000
		Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
		Sample ID	131SS-5C(0-1)	131SS-6A(0-1)	131SS-7A(0-1)	131SS-8A(0-1)	131SS-8ADUP(0-1)	131SS-9A(0-1)	131SS-10A(0-1)	131SS-11A(0-1)	131SS-12A(0-1)	131SS-13A(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit										
SVOC												
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	< 0.24 U									
1,2,4-Trichlorobenzene	120-82-1	mg/kg	< 0.04 U									
1,2-Dichlorobenzene	95-50-1	mg/kg	< 0.11 U									
1,3-Dichlorobenzene	541-73-1	mg/kg	< 0.13 U									
1,4-Dichlorobenzene	106-46-7	mg/kg	< 0.098 U									
2,4,5-Trichlorophenol	95-95-4	mg/kg	< 0.1 U									
2,4,6-Trichlorophenol	88-06-2	mg/kg	< 0.17 U									
2,4-Dichlorophenol	120-83-2	mg/kg	< 0.18 U									
2,4-Dimethylphenol	105-67-9	mg/kg	< 0.69 U									
2,4-Dinitrophenol	51-28-5	mg/kg	< 1.2 U									
2-Chloronaphthalene	91-58-7	mg/kg	< 0.036 U									
2-Chlorophenol	95-57-8	mg/kg	< 0.06 U									
2-Methylnaphthalene	91-57-6	mg/kg	< 0.049 U									
2-Methylphenol	95-48-7	mg/kg	< 0.029 U									
2-Nitroaniline	88-74-4	mg/kg	< 0.062 U									
2-Nitrophenol	88-75-5	mg/kg	< 0.14 U									
3,3'-Dichlorobenzidine	91-94-1	mg/kg	< 6.3 U									
3-Nitroaniline	99-09-2	mg/kg	< 0.45 U									
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg	< 0.55 U									
4-Bromophenyl phenyl ether	101-55-3	mg/kg	< 0.033 U									
4-Chloro-3-methylphenol	59-50-7	mg/kg	< 0.095 U									
4-Chloroaniline	106-47-8	mg/kg	< 0.81 U									
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	< 0.033 U									
4-Methylphenol	106-44-5	mg/kg	< 0.24 U#									
4-Nitroaniline	100-01-6	mg/kg	< 0.41 U									
4-Nitrophenol	100-02-7	mg/kg	< 1.4 U									
Acenaphthene	83-32-9	mg/kg	< 0.036 U	< 0.36 U	< 0.38 U	< 0.37 U	< 0.37 U	< 0.38 U			< 0.39 U	< 2.1 UD
Acenaphthylene	208-96-8	mg/kg	< 0.033 U	< 0.36 U	< 0.38 U	< 0.37 U	< 0.37 U	< 0.38 U			< 0.39 U	< 2.1 UD
Aniline	62-53-3	mg/kg	< 0.65 U									
Anthracene	120-12-7	mg/kg	2	< 0.36 U	< 0.38 U	< 0.37 U	< 0.37 U	< 0.38 U			< 0.39 U	< 2.1 UD
Benz(a)anthracene	56-55-3	mg/kg	4	0.11 J	0.14 J	0.11 J	0.14 J	< 0.38 U			0.09 J	< 2.1 UD
Benzo(a)pyrene	50-32-8	mg/kg	4	0.15 J	0.23 J	0.18 J	0.27 J	< 0.38 UJ			0.2 J	< 2.1 UD
Benzo(b)fluoranthene	205-99-2	mg/kg	4	0.23 J	0.44	0.48	0.58	0.2 J			0.45	< 2.1 UD
Benzo(g,h,i)perylene	191-24-2	mg/kg	< 0.25 U	0.09 J	0.17 J	0.17 J	0.23 J	0.07 J			0.16 J	< 2.1 UD
Benzo(k)fluoranthene	207-08-9	mg/kg	3	0.11 J	0.23 J	0.16 J	0.15 J	0.07 J			0.13 J	< 2.1 UD
Benzyl alcohol	100-51-6	mg/kg	< 0.19 U									
bis(2-Chloroethoxy)methane	111-91-1	mg/kg	< 0.059 U									
bis(2-Chloroethyl)ether	111-44-4	mg/kg	< 0.033 U									
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg	< 0.2 U									
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	< 0.62 U									
Butylbenzyl phthalate	85-68-7	mg/kg	< 0.17 U									
Carbazole	86-74-8	mg/kg	< 0.14 U									
Chrysene	218-01-9	mg/kg	5	0.21 J	0.46	0.37	0.48	0.12 J			0.39	< 2.1 UD
Dibenz(a,h)anthracene	53-70-3	mg/kg	< 0.21 U	< 0.36 U	< 0.38 U	< 0.37 U	0.04 J	< 0.38 UJ			< 0.39 U	< 2.1 UD
Dibenzofuran	132-64-9	mg/kg	0.5									
Diethylphthalate	84-66-2	mg/kg	< 0.24 U									
Dimethylphthalate	131-11-3	mg/kg	< 0.17 U									
di-n-Butylphthalate	84-74-2	mg/kg	< 0.061 U									
di-n-Octylphthalate	117-84-0	mg/kg	< 0.19 U									
Diphenylamine	122-39-4	mg/kg	< 0.13 U									
Fluoranthene	206-44-0	mg/kg	10	0.31 J	0.68	0.51	0.67	0.05 J			0.6	< 2.1 UD
Fluorene	86-73-7	mg/kg	1	< 0.36 U	< 0.38 U	< 0.37 U	< 0.37 U	< 0.38 U			< 0.39 U	< 2.1 UD
Hexachlorobenzene	118-74-1	mg/kg	< 0.033 U									
Hexachlorobutadiene	87-68-3	mg/kg	< 0.23 U									
Hexachlorocyclopentadiene	77-47-4	mg/kg	< 6.2 U									
Hexachloroethane	67-72-1	mg/kg	< 0.15 U									
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	< 0.29 U	0.09 J	0.18 J	0.19 J	0.24 J	0.07 J			0.18 J	< 2.1 UD
Isophorone	78-59-1	mg/kg	< 0.033 U									
Naphthalene	91-20-3	mg/kg	< 0.037 U	< 0.36 U	< 0.38 U	< 0.37 U	< 0.37 U	< 0.38 U			< 0.39 U	< 2.1 UD
n-Nitroso-di-n-propylamine	621-64-7	mg/kg	< 0.2 U									
n-Nitrosodiphenylamine	86-30-6	mg/kg	< 0.19 U									
Pentachlorophenol	87-86-5	mg/kg	< 1.3 U									
Phenanthrene	85-01-8	mg/kg	8	0.12 J	0.33 J	0.26 J	0.35 J	< 0.38 U			0.4	< 2.1 UD
Phenol	108-95-2	mg/kg	< 0.11 U									
Pyrene	129-00-0	mg/kg	7	0.24 J	0.46	0.36 J	0.44	< 0.38 U			0.42	< 2.1 UD

Table B-5
Historical Analytical Results for Soil at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-SS-005C	H-131-SS-006	H-131-SS-007	H-131-SS-008	H-131-SS-008	H-131-SS-009	H-131-SS-010A	H-131-SS-011	H-131-SS-012	H-131-SS-013
		Sample Date	12/7/1995	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000	12/5/2000
		Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
		Sample ID	131SS-5C(0-1)	131SS-6A(0-1)	131SS-7A(0-1)	131SS-8A(0-1)	131SS-8ADUP(0-1)	131SS-9A(0-1)	131SS-10A(0-1)	131SS-11A(0-1)	131SS-12A(0-1)	131SS-13A(0-1)
		Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	CAS No	Unit										
TPH												
Diesel Fuel	68334-30-5	mg/kg	< 8 U									
Gasoline range organics	GRO	mg/kg	< 8 U									
TPH, aviation gas fraction	50815-00-4	mg/kg	< 8 U									
TRPH	TRPH	mg/kg										
VOC												
1,1,1-Trichloroethane	71-55-6	mg/kg	< 0.44 U									
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	mg/kg	< 0.82 U									
1,1,2-Trichloroethane	79-00-5	mg/kg	< 0.54 U									
1,1-Dichloroethane	75-34-3	mg/kg	< 0.23 U									
1,1-Dichloroethene	75-35-4	mg/kg	< 0.39 U									
1,2-Dichloroethane	107-06-2	mg/kg	< 0.17 U									
1,2-Dichloroethene (total)	540-59-0	mg/kg	< 0.3 U									
1,2-Dichloropropane	78-87-5	mg/kg	< 0.29 U									
2-Butanone	78-93-3	mg/kg	< 0.07 U									
2-Hexanone	591-78-6	mg/kg	< 0.032 U									
4-Methyl-2-pentanone (MIBK)	108-10-1	mg/kg	< 0.027 U									
Acetone	67-64-1	mg/kg	< 0.017 U									
Acetonitrile	75-05-8	mg/kg	< 0.23 U									
Benzene	71-43-2	mg/kg	< 0.15 U									
Bromodichloromethane	75-27-4	mg/kg	< 0.29 U									
Bromoform	75-25-2	mg/kg	< 0.69 U									
Bromomethane	74-83-9	mg/kg	< 0.57 U									
Carbon disulfide	75-15-0	mg/kg	< 0.44 U									
Carbon tetrachloride	56-23-5	mg/kg	< 0.7 U									
Chlorobenzene	108-90-7	mg/kg	< 0.086 U									
Chloroethane	75-00-3	mg/kg	< 0.012 U									
Chloroform	67-66-3	mg/kg	< 0.087 U									
Chloromethane	74-87-3	mg/kg	< 0.88 U									
cis-1,3-Dichloropropene	10061-01-5	mg/kg	< 0.32 U									
Dibromochloromethane	124-48-1	mg/kg	< 0.31 U									
Dichlorodifluoromethane	75-71-8	mg/kg	< 0.014 U									
Ethanol	64-17-5	mg/kg	< 3.7 U									
Ethyl benzene	100-41-4	mg/kg	< 0.17 U									
Ethylene Oxide	75-21-8	mg/kg	< 0.3 U									
Isopropanol	67-63-0	mg/kg	< 0.79 U									
Methylene chloride	75-09-2	mg/kg	< 0.012 U									
Styrene	100-42-5	mg/kg	< 0.26 U									
tert-Butylalcohol	75-65-0	mg/kg	< 1 U									
Tetrachloroethene	127-18-4	mg/kg	< 0.081 U									
Toluene	108-88-3	mg/kg	< 0.078 U									
trans-1,3-Dichloropropene	10061-02-6	mg/kg	< 0.28 U									
Trichloroethene	79-01-6	mg/kg	< 0.28 U									
Trichlorofluoromethane	75-69-4	mg/kg	< 0.59 U									
Vinyl acetate	108-05-4	mg/kg	< 0.032 U									
Vinyl chloride	75-01-4	mg/kg	< 0.62 U									
Xylenes	1330-20-7	mg/kg	< 0.15 U									
WetChem												
% Solids	%Solid	%		91.9	87.9	89.5	89.5	87	84.2	79.8	83.6	77.6
Ammonia	7664-41-7	mg/kg	62.3									
Chloride	16887-00-6	mg/kg	< 6.05 U									
Cyanide	57-12-5	mg/kg	< 0.92 U									
Fluoride	16984-48-8	mg/kg	< 3.62 U									
Nitrate/Nitrite	Nitrate/Nitrite	mg/kg	1.64									
Phosphate	14265-44-2	mg/kg	260									
Sulfate	14808-79-8	mg/kg	< 90.4 U									
Sulfide	18496-25-8	mg/kg	28.7									

Table B-6
Historical Analytical Results for Groundwater at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-HP-001	H-131-HP-003	H-131-HP-004	H-131-HP-005	H-131-MW-001	H-131-MW-001	H-131-MW-002	H-131-MW-002	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003
		Sample Date	11/20/2000	11/20/2000	11/21/2000	11/20/2000	10/3/1996	12/20/2000	10/3/1996	12/20/2000	10/2/1996	12/21/2000	2/13/2002	10/15/2003	11/12/2003
		Depth Interval	10 - 11	7 - 8	23 - 24	17 - 18	14.6 - 24.6	14.6 - 24.6	28.91 - 38.91	28.91 - 38.91	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5
		Sample ID	131HP-1(20001120)	131HP-3(20001120)	131HP-4(20001121)	131HP-5(20001120)	131MW-1(19961003)	131MW-1(20001220)	131MW-2(19961003)	131MW-2(20001220)	131MW-3(19961002)	131MW-3(20001221)	131MW-3(20020213)	131MW-3(20031015)	131MW-3(20031112)
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Chemical Name	CAS No	Unit													
Dissolved Gas															
Ethane	74-84-0	ug/L													< 0.5 U
Ethene	74-85-1	ug/L													< 0.5 U
Hydrogen	1333-74-0	nM												1.1	
Methane	74-82-8	ug/L													< 0.5 U
Explosives															
1,3,5-Trinitrobenzene	99-35-4	ug/L					< 0.449 U		< 0.449 U		< 0.449 U				
1,3-Dinitrobenzene	99-65-0	ug/L					< 0.611 U		< 0.611 U		< 0.611 U				
2,4,6-Trinitrotoluene	118-96-7	ug/L					< 0.635 U		< 0.635 U		< 0.635 U				
HMX	2691-41-0	ug/L					< 1.21 U		< 1.21 U		< 1.21 U				
Nitrobenzene	98-95-3	ug/L					< 0.645 U		< 0.645 U		< 0.645 U				
Nitrocellulose	9004-70-0	ug/L					< 553 U		< 553 U		< 553 U				
Nitroglycerin	55-63-0	ug/L					< 10 U		< 10 U		< 10 U				
Nitroguanidine	556-88-7	ug/L					< 30.9 U		< 30.9 U		< 30.9 U				
PETN	78-11-5	ug/L					< 20 U		< 20 U		< 20 U				
Picric Acid	88-89-1	ug/L					< 0.27 U		< 0.27 U		< 0.27 U				
RDX	121-82-4	ug/L					< 1.17 U		< 1.17 U		< 1.17 U				
Tetrazene	14097-21-3	ug/L					< 40 U		< 40 U		< 40 U				
Tetryl	479-45-8	ug/L					< 1.56 U		< 1.56 U		< 1.56 U				
Explosives / SVOC															
2,4-Dinitrotoluene	121-14-2	ug/L					< 0.0637 U		< 0.0637 U		< 0.0637 U				
2,6-Dinitrotoluene	606-20-2	ug/L					< 0.0738 U		< 0.0738 U		< 0.0738 U				
Metals															
Aluminum	7429-90-5	ug/L					521		39.1		25.5				
Antimony	7440-36-0	ug/L					< 1 U		< 1 U		< 1 U				
Arsenic	7440-38-2	ug/L					6.07		< 1 U		< 1 U				
Barium	7440-39-3	ug/L					18.4		17.9		3.41				
Beryllium	7440-41-7	ug/L					< 5 U		< 5 U		< 5 U				
Boron	7440-42-8	ug/L					72.6		69.4		< 50 U				
Cadmium	7440-43-9	ug/L					< 3.01 U		< 3.01 U		< 3.01 U				
Calcium	7440-70-2	ug/L					29200		29300		23900				
Chromium	7440-47-3	ug/L					< 6.96 U		17.4		< 6.96 U				
Cobalt	7440-48-4	ug/L					< 50 U		< 50 U		< 50 U				
Copper	7440-50-8	ug/L					< 5 U		< 5 U		< 5 U				
Iron	7439-89-6	ug/L					276		57.9		< 36.8 U				62 J
Lead	7439-92-1	ug/L					1.64		1.36		< 1 U				
Magnesium	7439-95-4	ug/L					3880		5000		14700				
Manganese	7439-96-5	ug/L					11.9		3.16		< 2.5 U				
Mercury	7439-97-6	ug/L					< 0.243 U		< 0.243 U		< 0.243 U				
Nickel	7440-02-0	ug/L					< 7.11 U		< 7.11 U		< 7.11 U				
Potassium	7440-09-7	ug/L					21500		4190		< 1000 U				
Selenium	7782-49-2	ug/L					< 2 U		< 2 U		< 2 U				
Silver	7440-22-4	ug/L					< 4.42 U		< 4.42 U		< 4.42 U				
Sodium	7440-23-5	ug/L					32600		28800		< 2290 U				
Strontium	7440-24-6	ug/L					260		250		20.4				
Thallium	7440-28-0	ug/L					< 1 U		< 1 U		< 1 U				
Titanium	7440-32-6	ug/L					3.53		< 2 U		< 2 U				
Vanadium	7440-62-2	ug/L					6.63		< 4.69 U		< 4.69 U				
Zinc	7440-66-6	ug/L					< 35.8 U		< 35.8 U		< 35.8 U				
Zirconium	7440-67-7	ug/L					< 1 UJ		< 1 UJ		< 1 UJ				
Pesticides															
Mirex	2385-85-5	ug/L					< 0.025 U		< 0.025 U		< 0.025 U				

Table B-6
Historical Analytical Results for Groundwater at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-HP-001	H-131-HP-003	H-131-HP-004	H-131-HP-005	H-131-MW-001	H-131-MW-001	H-131-MW-002	H-131-MW-002	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003
		Sample Date	11/20/2000	11/20/2000	11/21/2000	11/20/2000	10/3/1996	12/20/2000	10/3/1996	12/20/2000	10/2/1996	12/21/2000	2/13/2002	10/15/2003	11/12/2003
		Depth Interval	10 - 11	7 - 8	23 - 24	17 - 18	14.6 - 24.6	14.6 - 24.6	28.91 - 38.91	28.91 - 38.91	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5
		Sample ID	131HP-1(20001120)	131HP-3(20001120)	131HP-4(20001121)	131HP-5(20001120)	131MW-1(19961003)	131MW-1(20001220)	131MW-2(19961003)	131MW-2(20001220)	131MW-3(19961002)	131MW-3(20001221)	131MW-3(20020213)	131MW-3(20031015)	131MW-3(20031112)
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG
Chemical Name	CAS No	Unit													
SVOC															
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.51 U	< 1 U	< 0.51 U	< 1 U	< 0.51 U	< 1 U	< 1 U		< 1 U
1,2,4-Trichlorobenzene	120-82-1	ug/L					< 1.8 U		< 1.8 U		< 1.8 U				
1,2-Dichlorobenzene	95-50-1	ug/L					< 1.7 U		< 1.7 U		< 1.7 U				
1,3-Dichlorobenzene	541-73-1	ug/L					< 1.7 U		< 1.7 U		< 1.7 U				
1,4-Dichlorobenzene	106-46-7	ug/L					< 1.7 U		< 1.7 U		< 1.7 U				
2,4,5-Trichlorophenol	95-95-4	ug/L					< 5.2 U		< 5.2 U		< 5.2 U				
2,4,6-Trichlorophenol	88-06-2	ug/L					< 4.2 U		< 4.2 U		< 4.2 U				
2,4-Dichlorophenol	120-83-2	ug/L					< 2.9 U		< 2.9 U		< 2.9 U				
2,4-Dimethylphenol	105-67-9	ug/L					< 5.8 U		< 5.8 U		< 5.8 U				
2,4-Dinitrophenol	51-28-5	ug/L					< 21 U		< 21 U		< 21 U				
2-Chloronaphthalene	91-58-7	ug/L					< 0.5 U		< 0.5 U		< 0.5 U				
2-Chlorophenol	95-57-8	ug/L					< 0.99 U		< 0.99 U		< 0.99 U				
2-Methylnaphthalene	91-57-6	ug/L					< 1.7 U		< 1.7 U		< 1.7 U				
2-Methylphenol	95-48-7	ug/L					< 3.9 U		< 3.9 U		< 3.9 U				
2-Nitroaniline	88-74-4	ug/L					< 4.3 U		< 4.3 U		< 4.3 U				
2-Nitrophenol	88-75-5	ug/L					< 3.7 U		< 3.7 U		< 3.7 U				
3,3'-Dichlorobenzidine	91-94-1	ug/L					< 12 U		< 12 U		< 12 U				
3-Nitroaniline	99-09-2	ug/L					< 4.9 U		< 4.9 U		< 4.9 U				
4,6-dinitro-2-Methylphenol	534-52-1	ug/L					< 17 U		< 17 U		< 17 U				
4-Bromophenyl phenyl ether	101-55-3	ug/L					< 4.2 U		< 4.2 U		< 4.2 U				
4-Chloro-3-methylphenol	59-50-7	ug/L					< 4 U		< 4 U		< 4 U				
4-Chloroaniline	106-47-8	ug/L					< 7.3 U		< 7.3 U		< 7.3 U				
4-Chlorophenyl phenyl ether	7005-72-3	ug/L					< 5.1 U		< 5.1 U		< 5.1 U				
4-Methylphenol	106-44-5	ug/L					< 0.52 U#		< 0.52 U#		< 0.52 U#				
4-Nitroaniline	100-01-6	ug/L					< 5.2 U		< 5.2 U		< 5.2 U				
4-Nitrophenol	100-02-7	ug/L					< 12 U		< 12 U		< 12 U				
Acenaphthene	83-32-9	ug/L					< 1.7 U		< 1.7 U		< 1.7 U				
Acenaphthylene	208-96-8	ug/L					< 0.5 U		< 0.5 U		< 0.5 U				
Aniline	62-53-3	ug/L					< 4.4 U		< 4.4 U		< 4.4 U				
Anthracene	120-12-7	ug/L					< 0.5 U		< 0.5 U		< 0.5 U				
Benz(a)anthracene	56-55-3	ug/L					< 1.6 U		< 1.6 U		< 1.6 U				
Benzo(a)pyrene	50-32-8	ug/L					< 4.7 U		< 4.7 U		< 4.7 U				
Benzo(b)fluoranthene	205-99-2	ug/L					< 5.4 U		< 5.4 U		< 5.4 U				
Benzo(g,h,i)perylene	191-24-2	ug/L					< 6.1 U		< 6.1 U		< 6.1 U				
Benzo(k)fluoranthene	207-08-9	ug/L					< 0.87 U		< 0.87 U		< 0.87 U				
Benzoic Acid	65-85-0	ug/L					< 13 U		< 13 U		< 13 U				
Benzyl alcohol	100-51-6	ug/L					< 0.72 U		< 0.72 U		< 0.72 U				
bis(2-Chloroethoxy)methane	111-91-1	ug/L					< 1.5 U		< 1.5 U		< 1.5 U				
bis(2-Chloroethyl)ether	111-44-4	ug/L					< 1.9 U		< 1.9 U		< 1.9 U				
bis(2-Chloroisopropyl)ether	39638-32-9	ug/L					< 5.3 U		< 5.3 U		< 5.3 U				
bis(2-Ethylhexyl)phthalate	117-81-7	ug/L					< 4.8 U		< 4.8 U		< 4.8 U				
Butylbenzyl phthalate	85-68-7	ug/L					< 3.4 U		< 3.4 U		< 3.4 U				
Carbazole	86-74-8	ug/L					< 2 U		< 2 U		< 2 U				
Chrysene	218-01-9	ug/L					< 2.4 U		< 2.4 U		< 2.4 U				
Dibenz(a,h)anthracene	53-70-3	ug/L					< 6.5 U		< 6.5 U		< 6.5 U				
Dibenzofuran	132-64-9	ug/L					< 1.7 U		< 1.7 U		< 1.7 U				
Diethylphthalate	84-66-2	ug/L					< 2 U		< 2 U		< 2 U				
Dimethylphthalate	131-11-3	ug/L					< 1.5 U		< 1.5 U		< 1.5 U				
di-n-Butylphthalate	84-74-2	ug/L					< 3.7 U		< 3.7 U		< 3.7 U				
di-n-Octylphthalate	117-84-0	ug/L					< 15 U		< 15 U		< 15 U				
Diphenylamine	122-39-4	ug/L					< 2.5 U		< 2.5 U		< 2.5 U				
Fluoranthene	206-44-0	ug/L					< 3.3 U		< 3.3 U		< 3.3 U				
Fluorene	86-73-7	ug/L					< 3.7 U		< 3.7 U		< 3.7 U				
Hexachlorobenzene	118-74-1	ug/L					< 1.6 U		< 1.6 U		< 1.6 U				
Hexachlorobutadiene	87-68-3	ug/L					< 3.4 U		< 3.4 U		< 3.4 U				
Hexachlorocyclopentadiene	77-47-4	ug/L					< 8.6 U		< 8.6 U		< 8.6 U				
Hexachloroethane	67-72-1	ug/L					< 1.5 U		< 1.5 U		< 1.5 U				
Indeno(1,2,3-c,d)pyrene	193-39-5	ug/L					< 8.6 U		< 8.6 U		< 8.6 U				
Isophorone	78-59-1	ug/L					< 4.8 U		< 4.8 U		< 4.8 U				
Naphthalene	91-20-3	ug/L					< 0.5 U		< 0.5 U		< 0.5 U				
n-Nitroso-di-n-propylamine	621-64-7	ug/L					< 4.4 U		< 4.4 U		< 4.4 U				
n-Nitrosodiphenylamine	86-30-6	ug/L					< 3 U		< 3 U		< 3 U				
Pentachlorophenol	87-86-5	ug/L					< 0.042 R		< 0.042 R		< 0.042 R				
Phenanthrene	85-01-8	ug/L					< 0.5 U		< 0.5 U		< 0.5 U				
Phenol	108-95-2	ug/L					< 9.2 U		< 9.2 U		< 9.2 U				
Pyrene	129-00-0	ug/L					< 2.8 U		< 2.8 U		< 2.8 U				

Table B-6
Historical Analytical Results for Groundwater at Site 131/PICA-131
Picatinny Arsenal, New Jersey

		Site Name	131	131	131	131	131	131	131	131	131	131	131	131	131	131
		Location ID	H-131-HP-001	H-131-HP-003	H-131-HP-004	H-131-HP-005	H-131-MW-001	H-131-MW-001	H-131-MW-002	H-131-MW-002	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003	H-131-MW-003
		Sample Date	11/20/2000	11/20/2000	11/21/2000	11/20/2000	10/3/1996	12/20/2000	10/3/1996	12/20/2000	10/2/1996	12/21/2000	2/13/2002	10/15/2003	11/12/2003	
		Depth Interval	10 - 11	7 - 8	23 - 24	17 - 18	14.6 - 24.6	14.6 - 24.6	28.91 - 38.91	28.91 - 38.91	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	28.5 - 38.5	
		Sample ID	131HP-1(20001120)	131HP-3(20001120)	131HP-4(20001121)	131HP-5(20001120)	131MW-1(19961003)	131MW-1(20001220)	131MW-2(19961003)	131MW-2(20001220)	131MW-3(19961002)	131MW-3(20001221)	131MW-3(20020213)	131MW-3(20031015)	131MW-3(20031112)	
		Sample Matrix	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	WG	
Chemical Name	CAS No	Unit														
TPH																
Diesel Range Organics	DRO	ug/L					< 340 U		< 340 U		< 340 U					
Gasoline range organics	GRO	ug/L					< 340 U		< 340 U		< 340 U					
TPH, aviation gas fraction	50815-00-4	ug/L					< 340 U		< 340 U		< 340 U					
TRPH	TRPH	ug/L					< 180000 U		< 172000 U		< 185000 U					
VOC																
1,1,1-Trichloroethane	71-55-6	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/L	0.86 J	2.4	< 1 U	< 1 U	24	17	< 5 U	8.6	70	18	19			33
1,1,2-Trichloroethane	79-00-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 1.2 U	< 1 U	< 1.2 U	< 1 U	< 1.2 U	< 1 U	< 1 U			< 1 U
1,1-Dichloroethane	75-34-3	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.68 U	< 1 U	< 0.68 U	< 1 U	< 0.68 U	< 1 U	< 1 U			< 1 U
1,1-Dichloroethene	75-35-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			0.32 J
1,2-Dichloroethane	107-06-2	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
1,2-Dichloroethene (total)	540-59-0	ug/L					< 0.5 U		< 0.5 U		< 0.5 U					
1,2-Dichloropropane	78-87-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
2-Butanone	78-93-3	ug/L	< 10 U	< 10 U	< 10 U	< 10 (U)	< 6.4 U	< 10 U	< 6.4 U	< 10 U	< 6.4 U	< 10 U	< 10 UJ			< 10 U
2-Hexanone	591-78-6	ug/L	< 10 U	< 10 U	< 10 U	< 10 U	< 3.6 U	< 10 U	< 3.6 U	< 10 U	< 3.6 U	< 10 U	< 10 UJ			< 10 U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	< 5 U	< 5 U	< 5 U	< 5 U	< 3 U	< 5 U	< 3 U	< 5 U	< 3 U	< 5 U	< 5 U			< 5 U
Acetone	67-64-1	ug/L	< 10 (U)	< 10 (U)	< 10 (U)	< 10 (U)	< 13 U	< 10 (U)	< 13 U	< 10 (U)	< 13 U	< 10 U	< 10 UJ			< 10 (U)
Acetonitrile	75-05-8	ug/L	< 20 R	< 20 R	< 20 R	< 20 R	< 200 U	< 20 U	< 200 U	< 20 U	< 200 U	< 20 U	< 20 R			< 20 U
Benzene	71-43-2	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
Bromodichloromethane	75-27-4	ug/L	< 1 U	0.28 J	< 1 U	< 1 U	< 0.59 U	< 1 U	< 0.59 U	< 1 U	< 0.59 U	< 1 U	< 1 U			< 1 U
Bromoform	75-25-2	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 2.6 U	< 1 U	< 2.6 U	< 1 U	< 2.6 U	< 1 UJ	< 1 U			< 1 U
Bromomethane	74-83-9	ug/L	< 2 U	< 2 U	< 2 U	< 2 U	< 5.8 U	< 2 U	< 5.8 U	< 2 U	< 5.8 U	< 2 UJ	< 2 UJ			< 2 U
Carbon disulfide	75-15-0	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	20	< 1 U			< 1 U
Carbon tetrachloride	56-23-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.58 U	< 1 U	< 0.58 U	< 1 U	< 0.58 U	< 1 UJ	< 1 U			< 1 U
Chlorobenzene	108-90-7	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
Chloroethane	75-00-3	ug/L	< 2 U	< 2 U	< 2 U	< 2 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 1.9 U	< 2 U	< 2 U			< 2 U
Chloroform	67-66-3	ug/L	< 1 U	< 1 (U)	< 1 U	< 1 U	< 0.5 U	0.48 J	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 (U)
Chloromethane	74-87-3	ug/L	< 2 U	< 2 U	< 2 U	< 2 U	< 3.2 U	< 2 U	< 3.2 U	< 2 U	< 3.2 U	< 2 U	< 2 U			< 2 U
cis-1,2-Dichloroethene	156-59-2	ug/L	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U		< 0.5 U		< 0.5 U		0.14 J	< 0.5 U			< 0.5 U
cis-1,3-Dichloropropene	10061-01-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.58 U	< 1 U	< 0.58 U	< 1 U	< 0.58 U	< 1 U	< 1 U			< 1 U
Dibromochloromethane	124-48-1	ug/L	< 1 U	0.2 J	< 1 U	< 1 U	< 0.67 U	< 1 U	< 0.67 U	< 1 U	< 0.67 U	< 1 U	< 1 U			< 1 U
Dichlorodifluoromethane	75-71-8	ug/L	< 2 U	< 2 U	< 2 U	< 2 U	< 6.9 U	< 2 U	< 6.9 U	< 2 U	< 6.9 U	< 2 UJ	< 2 U			< 2 U
Ethanol	64-17-5	ug/L					< 2000 U		< 2000 U		< 2000 U					
Ethyl benzene	100-41-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
Isopropanol	67-63-0	ug/L					< 400 U		< 400 U		< 400 U					
Methylene chloride	75-09-2	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	3	< 1 U	< 2.3 U	< 1 U	< 2.3 U	< 1 U	< 1 U			< 1 U
Styrene	100-42-5	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
tert-Butylalcohol	75-65-0	ug/L					< 500 U		< 500 U		< 500 U		< 50 R			
Tetrachloroethene	127-18-4	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 1.6 U	< 1 U	< 1.6 U	< 1 U	< 1.6 U	< 1 U	< 1 U			< 1 U
Toluene	108-88-3	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	0.56	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 1 U			< 1 U
trans-1,2-Dichloroethene	156-60-5	ug/L	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U		< 0.5 U		< 0.5 U		< 0.5 U	< 0.5 U			< 0.5 U
trans-1,3-Dichloropropene	10061-02-6	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.7 U	< 1 U	< 0.7 U	< 1 U	< 0.7 U	< 1 U	< 1 U			< 1 U
Trichloroethene	79-01-6	ug/L	0.63 J	1.6	< 1 U	0.44 J	< 0.5 U	0.34 J	< 0.5 U	< 1 U	2.7	3	2.1			3.7
Trichlorofluoromethane	75-69-4	ug/L	< 2 U	< 2 U	< 2 U	< 2 U	< 1.4 U	< 2 U	< 1.4 U	< 2 U	< 1.4 U	< 2 U	< 2 U			< 2 U
Vinyl acetate	108-05-4	ug/L					< 8.3 U		< 8.3 U		< 8.3 U					
Vinyl chloride	75-01-4	ug/L	< 2 U	< 2 U	< 2 U	< 2 U	< 2.6 U	< 2 U	< 2.6 U	< 2 U	< 2.6 U	< 2 U	< 2 U			< 2 U
Xylenes	1330-20-7	ug/L	< 1 U	< 1 U	< 1 U	< 1 U	< 0.84 U	< 1 U	< 0.84 U	< 1 U	< 0.84 U	< 1 U	< 1 U			< 1 U
WetChem																
Ammonia	7664-41-7	ug/L					104		< 60 U		< 60 U					20 J
Chloride	16887-00-6	ug/L					12100		23100		4060					13700
Cyanide	57-12-5	ug/L					< 2.5 U		< 2.5 U		< 2.5 U					
Dissolved Organic Carbon	DOC	ug/L														< 1000 R
Fluoride	16984-48-8	ug/L					< 1230 U		< 1230 U		< 1230 U					
Nitrate	14797-55-8	ug/L														170 J
Nitrate/Nitrite	Nitrate/Nitrite	ug/L					710		680		104					
Nitrite	14797-65-0	ug/L														< 500 U
Phosphate	14265-44-2	ug/L					127		15.7		24.4					
Sulfate	14808-79-8	ug/L					18000		12000		< 10000 U					8700
Sulfide	18496-25-8	ug/L					< 50 U		< 50 U		< 50 U					< 500 U

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

			RI Site Name	149	149	149	149	149	149	149	149
			Location ID	I-149-MW-001	I-149-MW-001	I-149-MW-002	I-149-MW-002	I-149-SB-001	I-149-SB-001	I-149-SB-002	I-149-SB-002
			Sample Date	4/18/1996	4/18/1996	6/12/1996	6/12/1996	6/14/1996	6/14/1996	6/17/1996	6/17/1996
			Depth Interval	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7
			Sample ID	149MW-1A(0-2)	149MW-1B(5-7)	149MW-2A(0-2)	149MW-2B(5-7)	149SB-1A(0-2)	149SB-1B(5-7)	149SB-2A(0-2)	149SB-2B(5-7)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	**CAS No**	**Unit**	ValueNo								
Explosives											
1,3,5-Trinitrobenzene	99-35-4	mg/kg	(1)	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U	< 0.488 U
1,3-Dinitrobenzene	99-65-0	mg/kg	(1)	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U	< 0.496 U
2,4,6-Trinitrotoluene	118-96-7	mg/kg	(1)	< 0.456 U	< 0.456 U	< 0.456 U	0.67	< 0.456 U	< 0.456 U	0.49	< 0.456 U
2-amino-4,6-Dinitrotoluene	35572-78-2	mg/kg	(1)								
2-Nitrotoluene	88-72-2	mg/kg	(1)								
3-Nitrotoluene	99-08-1	mg/kg	(1)								
4-amino-2,6-Dinitrotoluene	19406-51-0	mg/kg	(1)								
4-Nitrotoluene	99-99-0	mg/kg	(1)								
HMX	2691-41-0	mg/kg	(1)	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U	< 0.666 U
Nitrobenzene	98-95-3	mg/kg	(1)	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U	< 2.41 U
Nitrobenzene	98-95-3	mg/kg	(2)								
Nitrocellulose	9004-70-0	mg/kg	(1)	< 10.4 U	< 10.4 U	26.8	< 10.4 U	< 10.4 U	< 10.4 U	< 10.4 U	< 10.4 U
Nitroglycerin	55-63-0	mg/kg	(1)	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
Nitroguanidine	556-88-7	mg/kg	(1)	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U	< 0.475 U
PETN	78-11-5	mg/kg	(1)	< 4 U	< 4 U	< 4 U	15.1	< 4 U	< 4 U	< 4 U	< 4 U
Picric Acid	88-89-1	mg/kg	(1)	< 0.108 U	< 0.108 U	< 0.108 U	< 0.108 U	< 0.108 U	< 0.108 U	< 0.108 U	< 0.108 U
RDX	121-82-4	mg/kg	(1)	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U	< 0.587 U
Tetrazene	14097-21-3	mg/kg	(1)	< 1.19 R	< 1.19 R	< 1.19 R	< 1.19 R	< 1.19 R	< 1.19 R	< 1.19 U	< 1.19 U
Tetryl	479-45-8	mg/kg	(1)	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U	< 0.731 U
Explosives / SVOC											
2,4-Dinitrotoluene	121-14-2	mg/kg	(1)	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	< 0.424 U	630	10.3
2,4-Dinitrotoluene	121-14-2	mg/kg	(2)								
2,6-Dinitrotoluene	606-20-2	mg/kg	(1)	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U	< 0.524 U
2,6-Dinitrotoluene	606-20-2	mg/kg	(2)								
Metals											
Aluminum	7429-90-5	mg/kg	(1)	11800	7070	7960	13800	18600	5420	11400	10900
Antimony	7440-36-0	mg/kg	(1)	< 0.1 U	0.24	0.22	< 0.1 U	< 0.1 UJ	< 0.1 UJ	< 0.1 U	< 0.1 U
Arsenic	7440-38-2	mg/kg	(1)	4.53	6.11	15.8	10.8	8.75	3.41	9.31	5.95
Barium	7440-39-3	mg/kg	(1)	42.7	43.3	87.2	50.4	54.5	25.7	75.9	48
Beryllium	7440-41-7	mg/kg	(1)	< 0.5 U	< 0.5 U	0.63	0.72	0.79	< 0.5 U	0.73	< 0.5 U
Boron	7440-42-8	mg/kg	(1)	< 5.91 U	< 5.91 U	9.6	12.8	13.3	7.06	11.6	< 5.91 U
Cadmium	7440-43-9	mg/kg	(1)	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U
Calcium	7440-70-2	mg/kg	(1)	978	1080	3300	5500	620	546	4080	1770
Chromium	7440-47-3	mg/kg	(1)	15.4	13.2	42.4	34.1	22.4	37.9	20.1	26.1
Cobalt	7440-48-4	mg/kg	(1)	8.75	6.61	5.19	8.79	8.64	7.37	8.42	7.66
Copper	7440-50-8	mg/kg	(1)	13.1	16	19.5	32.5	16.9	17.2	29.1	17.8
Iron	7439-89-6	mg/kg	(1)	18900	15200	14300	22400	24000	15100	23500	21500
Lead	7439-92-1	mg/kg	(1)	37.8	82.1	76.2	66.6	25.2	17.7	97.1	40.6
Magnesium	7439-95-4	mg/kg	(1)	2390	1970	2610	4090	2510	1730	2740	2130
Manganese	7439-96-5	mg/kg	(1)	266	260	283	261	201	352	390	473
Mercury	7439-97-6	mg/kg	(1)	0.08	0.19	0.24	< 0.05 U	0.16	< 0.05 U	2.4	0.44
Nickel	7440-02-0	mg/kg	(1)	11	10.2	12.3	19.1	13.4	12.1	15.2	14.1
Potassium	7440-09-7	mg/kg	(1)	531	574	961	655	698	698	764	553
Selenium	7782-49-2	mg/kg	(1)	0.99	0.9	2.22	1.45	1.24	0.56	1.28	0.66
Silver	7440-22-4	mg/kg	(1)	< 0.589 U	< 0.589 U	< 0.589 U	< 0.589 U	< 0.589 U	< 0.589 U	< 0.589 U	< 0.589 U
Sodium	7440-23-5	mg/kg	(1)	357	343	418	444	410	411	433	419

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

			RI Site Name	149	149	149	149	149	149	149	149
			Location ID	I-149-MW-001	I-149-MW-001	I-149-MW-002	I-149-MW-002	I-149-SB-001	I-149-SB-001	I-149-SB-002	I-149-SB-002
			Sample Date	4/18/1996	4/18/1996	6/12/1996	6/12/1996	6/14/1996	6/14/1996	6/17/1996	6/17/1996
			Depth Interval	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7
			Sample ID	149MW-1A(0-2)	149MW-1B(5-7)	149MW-2A(0-2)	149MW-2B(5-7)	149SB-1A(0-2)	149SB-1B(5-7)	149SB-2A(0-2)	149SB-2B(5-7)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	**CAS No**	**Unit**	ValueNo								
Metals (continued)											
Strontium	7440-24-6	mg/kg	(1)	7.54	11.9	26	29.1	15.6	4.33	38 J	19.1 J
Thallium	7440-28-0	mg/kg	(1)	0.17	0.17	0.38	0.23	0.29	< 0.1 U	0.28	0.13
Titanium	7440-32-6	mg/kg	(1)	369	358	461	451	452	279	448	254
Vanadium	7440-62-2	mg/kg	(1)	27.2	22.3	20.5	24.3	34.6	13.4	26.6	23.5
Zinc	7440-66-6	mg/kg	(1)	69.8	58.2	133	154	73.4	32.6	495	50.9
Zirconium	7440-67-7	mg/kg	(1)	< 2.5 U	3.77	3.67	8.74	7.23	4.07	7.4	7.44
Pesticides											
Mirex	2385-85-5	mg/kg	(1)	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
SVOC											
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	(1)	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U
1,2,4-Trichlorobenzene	120-82-1	mg/kg	(1)	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U	< 0.04 U
1,2-Dichlorobenzene	95-50-1	mg/kg	(1)	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U
1,3-Dichlorobenzene	541-73-1	mg/kg	(1)	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U
1,4-Dichlorobenzene	106-46-7	mg/kg	(1)	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U	< 0.098 U
2,4,5-Trichlorophenol	95-95-4	mg/kg	(1)	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U
2,4,6-Trichlorophenol	88-06-2	mg/kg	(1)	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U
2,4-Dichlorophenol	120-83-2	mg/kg	(1)	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U
2,4-Dimethylphenol	105-67-9	mg/kg	(1)	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U
2,4-Dinitrophenol	51-28-5	mg/kg	(1)	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U	< 1.2 U
2-Chloronaphthalene	91-58-7	mg/kg	(1)	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U
2-Chlorophenol	95-57-8	mg/kg	(1)	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U	< 0.06 U
2-Methylnaphthalene	91-57-6	mg/kg	(1)	< 0.049 U	< 0.049 U	0.32	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U	< 0.049 U
2-Methylphenol	95-48-7	mg/kg	(1)	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U	< 0.029 U
2-Nitroaniline	88-74-4	mg/kg	(1)	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U	< 0.062 U
2-Nitrophenol	88-75-5	mg/kg	(1)	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U
3,3'-Dichlorobenzidine	91-94-1	mg/kg	(1)	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U	< 6.3 U
3-Nitroaniline	99-09-2	mg/kg	(1)	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U	< 0.45 U
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg	(1)	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U
4-Bromophenyl phenyl ether	101-55-3	mg/kg	(1)	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
4-Chloro-3-methylphenol	59-50-7	mg/kg	(1)	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U	< 0.095 U
4-Chloroaniline	106-47-8	mg/kg	(1)	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U	< 0.81 U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	(1)	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
4-Methylphenol	106-44-5	mg/kg	(1)	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#	< 0.24 U#
4-Nitroaniline	100-01-6	mg/kg	(1)	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U
4-Nitrophenol	100-02-7	mg/kg	(1)	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U
Acenaphthene	83-32-9	mg/kg	(1)	< 0.036 U	0.06	1.6	0.15	< 0.036 U	< 0.036 U	< 0.036 U	< 0.036 U
Acenaphthylene	208-96-8	mg/kg	(1)	< 0.033 U	< 0.033 U	0.28	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
Aniline	62-53-3	mg/kg	(1)	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U	< 0.65 U
Anthracene	120-12-7	mg/kg	(1)	0.09	0.18	3.8	0.36	0.07	< 0.033 U	0.05	< 0.033 U
Benz(a)anthracene	56-55-3	mg/kg	(1)	0.43	1	11	0.84	0.28	< 0.17 U	0.25	< 0.17 U
Benzo(a)pyrene	50-32-8	mg/kg	(1)	0.51	1.2	13	0.95	0.36	< 0.25 U	< 0.25 U	< 0.25 U
Benzo(b)fluoranthene	205-99-2	mg/kg	(1)	0.55	1.4	20	1.1	0.46	< 0.21 U	0.48	< 0.21 U
Benzo(g,h,i)perylene	191-24-2	mg/kg	(1)	< 0.25 U	0.4	3.2	0.64	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Benzo(k)fluoranthene	207-08-9	mg/kg	(1)	0.38	0.8	7	0.5	0.17	< 0.066 U	0.14	< 0.066 U
Benzyl alcohol	100-51-6	mg/kg	(1)	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U
bis(2-Chloroethoxy)methane	111-91-1	mg/kg	(1)	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U	< 0.059 U

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

			RI Site Name	149	149	149	149	149	149	149	149
			Location ID	I-149-MW-001	I-149-MW-001	I-149-MW-002	I-149-MW-002	I-149-SB-001	I-149-SB-001	I-149-SB-002	I-149-SB-002
			Sample Date	4/18/1996	4/18/1996	6/12/1996	6/12/1996	6/14/1996	6/14/1996	6/17/1996	6/17/1996
			Depth Interval	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7
			Sample ID	149MW-1A(0-2)	149MW-1B(5-7)	149MW-2A(0-2)	149MW-2B(5-7)	149SB-1A(0-2)	149SB-1B(5-7)	149SB-2A(0-2)	149SB-2B(5-7)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	**CAS No**	**Unit**	ValueNo								
SVOC (continued)											
bis(2-Chloroethyl)ether	111-44-4	mg/kg	(1)	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg	(1)	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	(1)	2.9	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U
Butylbenzyl phthalate	85-68-7	mg/kg	(1)	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U
Carbazole	86-74-8	mg/kg	(1)	< 0.14 U	< 0.14 U	1.6	0.18 J	< 0.14 U	< 0.14 U	< 0.14 U	< 0.14 U
Chrysene	218-01-9	mg/kg	(1)	0.64	1.5	20	1.4	0.53	< 0.12 U	0.36	< 0.12 U
Dibenz(a,h)anthracene	53-70-3	mg/kg	(1)	< 0.21 U	< 0.21 U	0.99	< 0.21 U	0.35	< 0.21 U	< 0.21 U	< 0.21 U
Dibenzofuran	132-64-9	mg/kg	(1)	< 0.035 U	< 0.035 U	0.69	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U	< 0.035 U
Diethylphthalate	84-66-2	mg/kg	(1)	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U
Dimethylphthalate	131-11-3	mg/kg	(1)	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U
di-n-Butylphthalate	84-74-2	mg/kg	(1)	< 0.061 U	< 0.061 U	0.43	< 0.061 U	< 0.061 U	< 0.061 U	0.26	< 0.061 U
di-n-Octylphthalate	117-84-0	mg/kg	(1)	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U
Diphenylamine	122-39-4	mg/kg	(1)	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U	< 0.13 U
Fluoranthene	206-44-0	mg/kg	(1)	1	2.4	30	2.4	0.75	< 0.068 U	0.49	0.09
Fluorene	86-73-7	mg/kg	(1)	< 0.033 U	0.06	1.7	0.19	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
Hexachlorobenzene	118-74-1	mg/kg	(1)	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
Hexachlorobutadiene	87-68-3	mg/kg	(1)	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U
Hexachlorocyclopentadiene	77-47-4	mg/kg	(1)	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U	< 6.2 U
Hexachloroethane	67-72-1	mg/kg	(1)	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	(1)	< 0.29 U	0.42	4.4	0.6	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U
Isophorone	78-59-1	mg/kg	(1)	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U	< 0.033 U
Naphthalene	91-20-3	mg/kg	(1)	< 0.037 U	< 0.037 U	0.43	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U	< 0.037 U
n-Nitroso-di-n-propylamine	621-64-7	mg/kg	(1)	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
n-Nitrosodiphenylamine	86-30-6	mg/kg	(1)	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U
Pentachlorophenol	87-86-5	mg/kg	(1)	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U
Phenanthrene	85-01-8	mg/kg	(1)	0.51	1	14	1.4	0.36	< 0.033 U	0.23	0.04
Phenol	108-95-2	mg/kg	(1)	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U	< 0.11 U
Pyrene	129-00-0	mg/kg	(1)	1.1	2.6	30	2.3	0.63	< 0.033 U	0.43	0.08
VOC											
1,1,1-Trichloroethane	71-55-6	mg/kg	(1)	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	mg/kg	(1)	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U	< 0.82 U
1,1,2-Trichloroethane	79-00-5	mg/kg	(1)	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U	< 0.54 U
1,1-Dichloroethane	75-34-3	mg/kg	(1)	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U
1,1-Dichloroethene	75-35-4	mg/kg	(1)	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U
1,2-Dichloroethane	107-06-2	mg/kg	(1)	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U
1,2-Dichloroethene (total)	540-59-0	mg/kg	(1)	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U
1,2-Dichloropropane	78-87-5	mg/kg	(1)	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U
2-Butanone	78-93-3	mg/kg	(1)	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U	< 0.07 U
2-Hexanone	591-78-6	mg/kg	(1)	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U
4-Methyl-2-pentanone (MIBK)	108-10-1	mg/kg	(1)	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U	< 0.027 U
Acetone	67-64-1	mg/kg	(1)	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U	< 0.017 U
Acetonitrile	75-05-8	mg/kg	(1)	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U	< 0.23 U
Benzene	71-43-2	mg/kg	(1)	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U
Bromodichloromethane	75-27-4	mg/kg	(1)	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U	< 0.29 U
Bromoform	75-25-2	mg/kg	(1)	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U	< 0.69 U
Bromomethane	74-83-9	mg/kg	(1)	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U	< 0.57 U

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

			RI Site Name	149	149	149	149	149	149	149	149
			Location ID	I-149-MW-001	I-149-MW-001	I-149-MW-002	I-149-MW-002	I-149-SB-001	I-149-SB-001	I-149-SB-002	I-149-SB-002
			Sample Date	4/18/1996	4/18/1996	6/12/1996	6/12/1996	6/14/1996	6/14/1996	6/17/1996	6/17/1996
			Depth Interval	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7	0 - 2	5 - 7
			Sample ID	149MW-1A(0-2)	149MW-1B(5-7)	149MW-2A(0-2)	149MW-2B(5-7)	149SB-1A(0-2)	149SB-1B(5-7)	149SB-2A(0-2)	149SB-2B(5-7)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	**CAS No**	**Unit**	ValueNo								
VOC (continued)											
Carbon disulfide	75-15-0	mg/kg	(1)	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U
Carbon tetrachloride	56-23-5	mg/kg	(1)	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U
Chlorobenzene	108-90-7	mg/kg	(1)	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U	< 0.086 U
Chloroethane	75-00-3	mg/kg	(1)	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U
Chloroform	67-66-3	mg/kg	(1)	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U	< 0.087 U
Chloromethane	74-87-3	mg/kg	(1)	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U	< 0.88 U
cis-1,3-Dichloropropene	10061-01-5	mg/kg	(1)	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U	< 0.32 U
Dibromochloromethane	124-48-1	mg/kg	(1)	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U	< 0.31 U
Dichlorodifluoromethane	75-71-8	mg/kg	(1)	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U	< 0.014 U
Ethanol	64-17-5	mg/kg	(1)	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U	< 3.7 U
Ethyl benzene	100-41-4	mg/kg	(1)	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U
Isopropanol	67-63-0	mg/kg	(1)	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U	< 0.79 U
Methylene chloride	75-09-2	mg/kg	(1)	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	< 0.012 U	0.02	< 0.012 U
Styrene	100-42-5	mg/kg	(1)	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U
tert-Butylalcohol	75-65-0	mg/kg	(1)	< 0.5 U	< 0.5 U			< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	127-18-4	mg/kg	(1)	< 0.081 U	< 0.081 U	0.09	0.11	< 0.081 U	< 0.081 U	< 0.081 U	< 0.081 U
Toluene	108-88-3	mg/kg	(1)	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	< 0.078 U	0.12	< 0.078 U
trans-1,3-Dichloropropene	10061-02-6	mg/kg	(1)	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U
Trichloroethene	79-01-6	mg/kg	(1)	< 0.28 U	< 0.28 U	< 0.28 U	0.4	< 0.28 U	< 0.28 U	0.36	< 0.28 U
Trichlorofluoromethane	75-69-4	mg/kg	(1)	< 0.59 U	< 0.59 U	0.01	0.96	< 0.59 U	0.55	< 0.59 U	< 0.59 U
Vinyl acetate	108-05-4	mg/kg	(1)	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U	< 0.032 U
Vinyl chloride	75-01-4	mg/kg	(1)	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U	< 0.62 U
Xylenes	1330-20-7	mg/kg	(1)	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U
WetChem											
% Solids	%Solid	%	(1)								
Ammonia	7664-41-7	mg/kg	(1)	78.7	101	115	85.7	101	< 12.5 U	63.5	26.1
Chloride	16887-00-6	mg/kg	(1)	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U	< 6.05 U
Cyanide	57-12-5	mg/kg	(1)	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U
Fluoride	16984-48-8	mg/kg	(1)	6.91	7.61	5.65	12.6	5.15	< 3.62 U	6.15	15.3
Nitrate/Nitrite	Nitrate/Nitrite	mg/kg	(1)	< 0.6 U	< 0.6 U	4.64	< 0.6 U	< 0.6 U	< 0.6 U	1.66	1.16
Phosphate	14265-44-2	mg/kg	(1)	18.1	23	1000	580	230	260	380	310
Sulfate	14808-79-8	mg/kg	(1)	< 90.4 U	< 90.4 U	< 90.4 U	< 90.4 U	138	< 90.4 U	< 90.4 U	< 90.4 U
Sulfide	18496-25-8	mg/kg	(1)	< 6 U	< 6 U	11.4	< 6 U	< 6 U	< 6 U	1700	49

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

			RI Site Name	149	149	149	149	149	149	149	149	149
			Location ID	I-149-SS-001	I-149-SS-002	I-149-SS-002	I-149-SS-003	I-149-SS-004	I-149-SS-005	I-149-SS-006	I-149-SS-007	I-149-SS-008
			Sample Date	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	2/13/2002
			Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
			Sample ID	149SS-1A(0-1)	149SS-2A(0-1)	149SS-2ADUP(0-1)	149SS-3A(0-1)	149SS-4A(0-1)	149SS-5A(0-1)	149SS-6A(0-1)	149SS-7A(0-1)	149SS-8(0-1)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	**CAS No**	**Unit**	**ValueNo**									
Explosives												
1,3,5-Trinitrobenzene	99-35-4	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
1,3-Dinitrobenzene	99-65-0	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
2,4,6-Trinitrotoluene	118-96-7	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
2-amino-4,6-Dinitrotoluene	35572-78-2	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
2-Nitrotoluene	88-72-2	mg/kg	(1)	< 0.32 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
3-Nitrotoluene	99-08-1	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
4-amino-2,6-Dinitrotoluene	19406-51-0	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
4-Nitrotoluene	99-99-0	mg/kg	(1)	< 0.25 U			< 0.25 U		< 0.25 U	< 0.25 U	< 0.25 U	
HMX	2691-41-0	mg/kg	(1)	< 0.5 U			< 0.5 U		< 0.5 U	< 0.5 U	< 0.5 U	
Nitrobenzene	98-95-3	mg/kg	(1)	< 0.25 U	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD	< 0.25 U	< 0.25 U	< 0.25 U	
Nitrobenzene	98-95-3	mg/kg	(2)	< 0.97 UD			< 0.25 U					
Nitrocellulose	9004-70-0	mg/kg	(1)									
Nitroglycerin	55-63-0	mg/kg	(1)									
Nitroguanidine	556-88-7	mg/kg	(1)									
PETN	78-11-5	mg/kg	(1)									
Picric Acid	88-89-1	mg/kg	(1)									
RDX	121-82-4	mg/kg	(1)	< 0.5 U			< 0.5 U		< 0.5 U	< 0.5 U	< 0.5 U	
Tetrazene	14097-21-3	mg/kg	(1)									
Tetryl	479-45-8	mg/kg	(1)	< 0.65 U			< 0.65 U		< 0.65 U	< 0.65 U	< 0.65 U	
Explosives / SVOC												
2,4-Dinitrotoluene	121-14-2	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.25 U	< 0.96 UD	< 0.25 U	< 0.25 U	< 0.25 U	
2,4-Dinitrotoluene	121-14-2	mg/kg	(2)	< 0.25 (U)			< 0.71 UD					
2,6-Dinitrotoluene	606-20-2	mg/kg	(1)	< 0.25 U	< 2.4 UD	< 1.5 UD	< 0.25 U	< 0.96 UD	< 0.25 U	< 0.25 U	< 0.25 U	
2,6-Dinitrotoluene	606-20-2	mg/kg	(2)	< 0.97 UD			< 0.71 UD					
Metals												
Aluminum	7429-90-5	mg/kg	(1)									
Antimony	7440-36-0	mg/kg	(1)									
Arsenic	7440-38-2	mg/kg	(1)									
Barium	7440-39-3	mg/kg	(1)									
Beryllium	7440-41-7	mg/kg	(1)									
Boron	7440-42-8	mg/kg	(1)									
Cadmium	7440-43-9	mg/kg	(1)									
Calcium	7440-70-2	mg/kg	(1)									
Chromium	7440-47-3	mg/kg	(1)									
Cobalt	7440-48-4	mg/kg	(1)									
Copper	7440-50-8	mg/kg	(1)									
Iron	7439-89-6	mg/kg	(1)									
Lead	7439-92-1	mg/kg	(1)									
Magnesium	7439-95-4	mg/kg	(1)									
Manganese	7439-96-5	mg/kg	(1)									
Mercury	7439-97-6	mg/kg	(1)									
Nickel	7440-02-0	mg/kg	(1)									
Potassium	7440-09-7	mg/kg	(1)									
Selenium	7782-49-2	mg/kg	(1)									
Silver	7440-22-4	mg/kg	(1)									
Sodium	7440-23-5	mg/kg	(1)									

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Unit	RI Site Name / Location ID / Sample Date / Depth Interval / Sample ID / Sample Matrix / ValueNo	149 I-149-SS-001 5/2/2001 0 - 1 149SS-1A(0-1) SO	149 I-149-SS-002 5/2/2001 0 - 1 149SS-2A(0-1) SO	149 I-149-SS-002 5/2/2001 0 - 1 149SS-2ADUP(0-1) SO	149 I-149-SS-003 5/2/2001 0 - 1 149SS-3A(0-1) SO	149 I-149-SS-004 5/2/2001 0 - 1 149SS-4A(0-1) SO	149 I-149-SS-005 5/2/2001 0 - 1 149SS-5A(0-1) SO	149 I-149-SS-006 5/2/2001 0 - 1 149SS-6A(0-1) SO	149 I-149-SS-007 5/2/2001 0 - 1 149SS-7A(0-1) SO	149 I-149-SS-008 2/13/2002 0 - 1 149SS-8(0-1) SO
Metals (continued)												
Strontium	7440-24-6	mg/kg	(1)									
Thallium	7440-28-0	mg/kg	(1)									
Titanium	7440-32-6	mg/kg	(1)									
Vanadium	7440-62-2	mg/kg	(1)									
Zinc	7440-66-6	mg/kg	(1)									
Zirconium	7440-67-7	mg/kg	(1)									
Pesticides												
Mirex	2385-85-5	mg/kg	(1)									
SVOC												
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	(1)									
1,2,4-Trichlorobenzene	120-82-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
1,2-Dichlorobenzene	95-50-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
1,3-Dichlorobenzene	541-73-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
1,4-Dichlorobenzene	106-46-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2,4,5-Trichlorophenol	95-95-4	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2,4,6-Trichlorophenol	88-06-2	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2,4-Dichlorophenol	120-83-2	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2,4-Dimethylphenol	105-67-9	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2,4-Dinitrophenol	51-28-5	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
2-Chloronaphthalene	91-58-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2-Chlorophenol	95-57-8	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2-Methylnaphthalene	91-57-6	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2-Methylphenol	95-48-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
2-Nitroaniline	88-74-4	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
2-Nitrophenol	88-75-5	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
3,3'-Dichlorobenzidine	91-94-1	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
3-Nitroaniline	99-09-2	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
4,6-dinitro-2-Methylphenol	534-52-1	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
4-Bromophenyl phenyl ether	101-55-3	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
4-Chloro-3-methylphenol	59-50-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
4-Chloroaniline	106-47-8	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
4-Methylphenol	106-44-5	mg/kg	(1)	< 0.97 UD#	< 2.4 UD#	< 1.5 UD#	< 0.71 UD#	< 0.96 UD#				
4-Nitroaniline	100-01-6	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
4-Nitrophenol	100-02-7	mg/kg	(1)	< 4.7 UD	< 12 UD	< 7 UD	< 3.4 UD	< 4.7 UD				
Acenaphthene	83-32-9	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				< 0.48 U
Acenaphthylene	208-96-8	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				0.08 J
Aniline	62-53-3	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Anthracene	120-12-7	mg/kg	(1)	< 0.97 UD	1.4 JD	0.73 JD	0.33 JD	0.66 JD				0.15 J
Benz(a)anthracene	56-55-3	mg/kg	(1)	2.2 JD	6.3 D	3.5 D	1.5 D	3.8 D				1.1
Benzo(a)pyrene	50-32-8	mg/kg	(1)	3.1 JD	7 D	4.1 D	1.8 D	4.7 JD				1.5
Benzo(b)fluoranthene	205-99-2	mg/kg	(1)	7 JD	9 D	4.5 D	2.1 D	5.9 JD				2.3
Benzo(g,h,i)perylene	191-24-2	mg/kg	(1)	1.7 JD	3.7 D	2.3 D	1 D	3 JD				0.82
Benzo(k)fluoranthene	207-08-9	mg/kg	(1)	3 JD	3.7 D	2.6 D	0.95 D	2.3 JD				1.2
Benzyl alcohol	100-51-6	mg/kg	(1)									
bis(2-Chloroethoxy)methane	111-91-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Chemical Name	CAS No	Unit	RI Site Name / Location ID / Sample Date / Depth Interval / Sample ID / Sample Matrix / ValueNo	149 / I-149-SS-001 / 5/2/2001 / 0 - 1 / 149SS-1A(0-1) / SO	149 / I-149-SS-002 / 5/2/2001 / 0 - 1 / 149SS-2A(0-1) / SO	149 / I-149-SS-002 / 5/2/2001 / 0 - 1 / 149SS-2ADUP(0-1) / SO	149 / I-149-SS-003 / 5/2/2001 / 0 - 1 / 149SS-3A(0-1) / SO	149 / I-149-SS-004 / 5/2/2001 / 0 - 1 / 149SS-4A(0-1) / SO	149 / I-149-SS-005 / 5/2/2001 / 0 - 1 / 149SS-5A(0-1) / SO	149 / I-149-SS-006 / 5/2/2001 / 0 - 1 / 149SS-6A(0-1) / SO	149 / I-149-SS-007 / 5/2/2001 / 0 - 1 / 149SS-7A(0-1) / SO	149 / I-149-SS-008 / 2/13/2002 / 0 - 1 / 149SS-8(0-1) / SO
SVOC (continued)												
bis(2-Chloroethyl)ether	111-44-4	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
bis(2-Chloroisopropyl)ether	39638-32-9	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Butylbenzyl phthalate	85-68-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Carbazole	86-74-8	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Chrysene	218-01-9	mg/kg	(1)	3.5 JD	7 D	4.2 D	1.7 D	4.7 D				1.4
Dibenz(a,h)anthracene	53-70-3	mg/kg	(1)	0.63 JD	1.1 JD	0.69 JD	0.28 JD	0.81 JD				0.33 J
Dibenzofuran	132-64-9	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Diethylphthalate	84-66-2	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Dimethylphthalate	131-11-3	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
di-n-Butylphthalate	84-74-2	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
di-n-Octylphthalate	117-84-0	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Diphenylamine	122-39-4	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Fluoranthene	206-44-0	mg/kg	(1)	2.8 D	16 D	8.6 D	3.9 D	8.5 D				1
Fluorene	86-73-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				0.23 J
Hexachlorobenzene	118-74-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Hexachlorobutadiene	87-68-3	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Hexachlorocyclopentadiene	77-47-4	mg/kg	(1)	< 4.7 UJD	< 12 UJD	< 7 UJD	< 3.4 UJD	< 4.7 UD				
Hexachloroethane	67-72-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	(1)	1.9 JD	3.4 D	2.1 D	0.96 D	2.7 JD				0.83
Isophorone	78-59-1	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Naphthalene	91-20-3	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				< 0.48 U
n-Nitroso-di-n-propylamine	621-64-7	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
n-Nitrosodiphenylamine	86-30-6	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Pentachlorophenol	87-86-5	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Phenanthrene	85-01-8	mg/kg	(1)	< 0.97 UD	8.9 D	4.9 D	1.8 D	3.9 D				0.31 J
Phenol	108-95-2	mg/kg	(1)	< 0.97 UD	< 2.4 UD	< 1.5 UD	< 0.71 UD	< 0.96 UD				
Pyrene	129-00-0	mg/kg	(1)	2.9 JD	15 D	8.7 D	3.1 D	8.5 D				1.9
VOC												
1,1,1-Trichloroethane	71-55-6	mg/kg	(1)									
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	mg/kg	(1)									
1,1,2-Trichloroethane	79-00-5	mg/kg	(1)									
1,1-Dichloroethane	75-34-3	mg/kg	(1)									
1,1-Dichloroethene	75-35-4	mg/kg	(1)									
1,2-Dichloroethane	107-06-2	mg/kg	(1)									
1,2-Dichloroethene (total)	540-59-0	mg/kg	(1)									
1,2-Dichloropropane	78-87-5	mg/kg	(1)									
2-Butanone	78-93-3	mg/kg	(1)									
2-Hexanone	591-78-6	mg/kg	(1)									
4-Methyl-2-pentanone (MIBK)	108-10-1	mg/kg	(1)									
Acetone	67-64-1	mg/kg	(1)									
Acetonitrile	75-05-8	mg/kg	(1)									
Benzene	71-43-2	mg/kg	(1)									
Bromodichloromethane	75-27-4	mg/kg	(1)									
Bromoform	75-25-2	mg/kg	(1)									
Bromomethane	74-83-9	mg/kg	(1)									

Table B-7
Historical Analytical Results for Soil Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

			RI Site Name	149	149	149	149	149	149	149	149	149
			Location ID	I-149-SS-001	I-149-SS-002	I-149-SS-002	I-149-SS-003	I-149-SS-004	I-149-SS-005	I-149-SS-006	I-149-SS-007	I-149-SS-008
			Sample Date	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	5/2/2001	2/13/2002
			Depth Interval	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
			Sample ID	149SS-1A(0-1)	149SS-2A(0-1)	149SS-2ADUP(0-1)	149SS-3A(0-1)	149SS-4A(0-1)	149SS-5A(0-1)	149SS-6A(0-1)	149SS-7A(0-1)	149SS-8(0-1)
			Sample Matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO
Chemical Name	**CAS No**	**Unit**	**ValueNo**									
VOC (continued)												
Carbon disulfide	75-15-0	mg/kg	(1)									
Carbon tetrachloride	56-23-5	mg/kg	(1)									
Chlorobenzene	108-90-7	mg/kg	(1)									
Chloroethane	75-00-3	mg/kg	(1)									
Chloroform	67-66-3	mg/kg	(1)									
Chloromethane	74-87-3	mg/kg	(1)									
cis-1,3-Dichloropropene	10061-01-5	mg/kg	(1)									
Dibromochloromethane	124-48-1	mg/kg	(1)									
Dichlorodifluoromethane	75-71-8	mg/kg	(1)									
Ethanol	64-17-5	mg/kg	(1)									
Ethyl benzene	100-41-4	mg/kg	(1)									
Isopropanol	67-63-0	mg/kg	(1)									
Methylene chloride	75-09-2	mg/kg	(1)									
Styrene	100-42-5	mg/kg	(1)									
tert-Butylalcohol	75-65-0	mg/kg	(1)									
Tetrachloroethene	127-18-4	mg/kg	(1)									
Toluene	108-88-3	mg/kg	(1)									
trans-1,3-Dichloropropene	10061-02-6	mg/kg	(1)									
Trichloroethene	79-01-6	mg/kg	(1)									
Trichlorofluoromethane	75-69-4	mg/kg	(1)									
Vinyl acetate	108-05-4	mg/kg	(1)									
Vinyl chloride	75-01-4	mg/kg	(1)									
Xylenes	1330-20-7	mg/kg	(1)									
WetChem												
% Solids	%Solid	%	(1)	84.7	91	90.9	93.4	85.6				69.3
Ammonia	7664-41-7	mg/kg	(1)									
Chloride	16887-00-6	mg/kg	(1)									
Cyanide	57-12-5	mg/kg	(1)									
Fluoride	16984-48-8	mg/kg	(1)									
Nitrate/Nitrite	Nitrate/Nitrite	mg/kg	(1)									
Phosphate	14265-44-2	mg/kg	(1)									
Sulfate	14808-79-8	mg/kg	(1)									
Sulfide	18496-25-8	mg/kg	(1)									

Table B-8
Historical Analytical Results for Groundwater Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

		RI Site Name	149	149
		Location ID	I-149-MW-001	I-149-MW-002
		Sample Date	10/17/1996	10/17/1996
		Depth Interval	26.53 - 36.53	26.66 - 36.66
		Sample ID	149MW-1(19961017)	149MW-2(19961017)
		Sample Matrix	WG	WG
Chemical Name	**CAS No**	**Unit**		
Explosives				
1,3,5-Trinitrobenzene	99-35-4	ug/L	< 0.449 U	< 0.449 U
1,3-Dinitrobenzene	99-65-0	ug/L	< 0.611 U	< 0.611 U
2,4,6-Trinitrotoluene	118-96-7	ug/L	< 0.635 U	< 0.635 U
HMX	2691-41-0	ug/L	< 1.21 U	< 1.21 U
Nitrobenzene	98-95-3	ug/L	< 0.645 U	< 0.645 U
Nitrocellulose	9004-70-0	ug/L	< 553 U	< 553 U
Nitroglycerin	55-63-0	ug/L	< 10 U	< 10 U
Nitroguanidine	556-88-7	ug/L	< 30.9 U	< 30.9 U
PETN	78-11-5	ug/L	< 20 U	< 20 U
Picric Acid	88-89-1	ug/L	< 0.27 U	< 0.27 U
RDX	121-82-4	ug/L	< 1.17 U	< 1.17 U
Tetrazene	14097-21-3	ug/L	< 40 U	< 40 U
Tetryl	479-45-8	ug/L	< 1.56 U	< 1.56 U
Explosives / SVOC				
2,4-Dinitrotoluene	121-14-2	ug/L	< 0.0637 U	< 0.0637 U
2,6-Dinitrotoluene	606-20-2	ug/L	< 0.0738 U	< 0.0738 U
Metals				
Aluminum	7429-90-5	ug/L	25.3	< 23.5 U
Antimony	7440-36-0	ug/L	< 1 U	< 1 U
Arsenic	7440-38-2	ug/L	< 1 U	< 1 U
Barium	7440-39-3	ug/L	8.16	7.09
Beryllium	7440-41-7	ug/L	< 5 U	< 5 U
Boron	7440-42-8	ug/L	< 50 U	< 50 U
Cadmium	7440-43-9	ug/L	< 3.01 U	< 3.01 U
Calcium	7440-70-2	ug/L	10100	10600
Chromium	7440-47-3	ug/L	< 6.96 U	< 6.96 U
Cobalt	7440-48-4	ug/L	< 50 U	< 50 U
Copper	7440-50-8	ug/L	< 5 U	< 5 U
Iron	7439-89-6	ug/L	46.8	40.2
Lead	7439-92-1	ug/L	2.45	< 1 U
Magnesium	7439-95-4	ug/L	2860	3080
Manganese	7439-96-5	ug/L	28.8	40.9
Mercury	7439-97-6	ug/L	< 0.243 U	< 0.243 U
Nickel	7440-02-0	ug/L	< 7.11 U	< 7.11 U
Potassium	7440-09-7	ug/L	< 1000 U	< 1000 U
Selenium	7782-49-2	ug/L	< 2 U	< 2 U
Silver	7440-22-4	ug/L	< 4.42 U	< 4.42 U
Sodium	7440-23-5	ug/L	14100	15000
Strontium	7440-24-6	ug/L	46.4	46.2
Thallium	7440-28-0	ug/L	< 1 U	< 1 U
Titanium	7440-32-6	ug/L	< 2 U	< 2 U
Vanadium	7440-62-2	ug/L	< 4.69 U	< 4.69 U
Zinc	7440-66-6	ug/L	< 35.8 U	< 35.8 U
Zirconium	7440-67-7	ug/L	< 1 U	< 1 U

Table B-8
Historical Analytical Results for Groundwater Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

		RI Site Name	149	149
		Location ID	I-149-MW-001	I-149-MW-002
		Sample Date	10/17/1996	10/17/1996
		Depth Interval	26.53 - 36.53	26.66 - 36.66
		Sample ID	149MW-1(19961017)	149MW-2(19961017)
		Sample Matrix	WG	WG
Chemical Name	**CAS No**	**Unit**		
Pesticides				
Mirex	2385-85-5	ug/L	< 0.025 U	< 0.025 U
SVOC				
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	< 0.51 U	< 0.51 U
1,2,4-Trichlorobenzene	120-82-1	ug/L	< 1.8 U	< 1.8 U
1,2-Dichlorobenzene	95-50-1	ug/L	< 1.7 U	< 1.7 U
1,3-Dichlorobenzene	541-73-1	ug/L	< 1.7 U	< 1.7 U
1,4-Dichlorobenzene	106-46-7	ug/L	< 1.7 U	< 1.7 U
2,4,5-Trichlorophenol	95-95-4	ug/L	< 5.2 U	< 5.2 U
2,4,6-Trichlorophenol	88-06-2	ug/L	< 4.2 U	< 4.2 U
2,4-Dichlorophenol	120-83-2	ug/L	< 2.9 U	< 2.9 U
2,4-Dimethylphenol	105-67-9	ug/L	< 5.8 U	< 5.8 U
2,4-Dinitrophenol	51-28-5	ug/L	< 21 U	< 21 U
2-Chloronaphthalene	91-58-7	ug/L	< 0.5 U	< 0.5 U
2-Chlorophenol	95-57-8	ug/L	< 0.99 U	< 0.99 U
2-Methylnaphthalene	91-57-6	ug/L	< 1.7 U	< 1.7 U
2-Methylphenol	95-48-7	ug/L	< 3.9 U	< 3.9 U
2-Nitroaniline	88-74-4	ug/L	< 4.3 U	< 4.3 U
2-Nitrophenol	88-75-5	ug/L	< 3.7 U	< 3.7 U
3,3'-Dichlorobenzidine	91-94-1	ug/L	< 12 U	< 12 U
3-Nitroaniline	99-09-2	ug/L	< 4.9 U	< 4.9 U
4,6-dinitro-2-Methylphenol	534-52-1	ug/L	< 17 U	< 17 U
4-Bromophenyl phenyl ether	101-55-3	ug/L	< 4.2 U	< 4.2 U
4-Chloro-3-methylphenol	59-50-7	ug/L	< 4 U	< 4 U
4-Chloroaniline	106-47-8	ug/L	< 7.3 U	< 7.3 U
4-Chlorophenyl phenyl ether	7005-72-3	ug/L	< 5.1 U	< 5.1 U
4-Methylphenol	106-44-5	ug/L	< 0.52 U#	< 0.52 U#
4-Nitroaniline	100-01-6	ug/L	< 5.2 U	< 5.2 U
4-Nitrophenol	100-02-7	ug/L	< 12 U	< 12 U
Acenaphthene	83-32-9	ug/L	< 1.7 U	< 1.7 U
Acenaphthylene	208-96-8	ug/L	< 0.5 U	< 0.5 U
Aniline	62-53-3	ug/L	< 4.4 U	< 4.4 U
Anthracene	120-12-7	ug/L	< 0.5 U	< 0.5 U
Benz(a)anthracene	56-55-3	ug/L	< 1.6 U	< 1.6 U
Benzo(a)pyrene	50-32-8	ug/L	< 4.7 U	< 4.7 U
Benzo(b)fluoranthene	205-99-2	ug/L	< 5.4 U	< 5.4 U
Benzo(g,h,i)perylene	191-24-2	ug/L	< 6.1 U	< 6.1 U
Benzo(k)fluoranthene	207-08-9	ug/L	< 0.87 U	< 0.87 U
Benzoic Acid	65-85-0	ug/L	< 13 U	< 13 U
Benzyl alcohol	100-51-6	ug/L	< 0.72 U	< 0.72 U
bis(2-Chloroethoxy)methane	111-91-1	ug/L	< 1.5 U	< 1.5 U
bis(2-Chloroethyl)ether	111-44-4	ug/L	< 1.9 U	< 1.9 U
bis(2-Chloroisopropyl)ether	39638-32-9	ug/L	< 5.3 U	< 5.3 U
bis(2-Ethylhexyl)phthalate	117-81-7	ug/L	< 4.8 U	< 4.8 U
Butylbenzyl phthalate	85-68-7	ug/L	< 3.4 U	< 3.4 U

Table B-8
Historical Analytical Results for Groundwater Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

		RI Site Name	149	149
		Location ID	I-149-MW-001	I-149-MW-002
		Sample Date	10/17/1996	10/17/1996
		Depth Interval	26.53 - 36.53	26.66 - 36.66
		Sample ID	149MW-1(19961017)	149MW-2(19961017)
		Sample Matrix	WG	WG
Chemical Name	**CAS No**	**Unit**		
SVOC Contd.				
Carbazole	86-74-8	ug/L	< 2 U	< 2 U
Chrysene	218-01-9	ug/L	< 2.4 U	< 2.4 U
Dibenz(a,h)anthracene	53-70-3	ug/L	< 6.5 U	< 6.5 U
Dibenzofuran	132-64-9	ug/L	< 1.7 U	< 1.7 U
Diethylphthalate	84-66-2	ug/L	< 2 U	< 2 U
Dimethylphthalate	131-11-3	ug/L	< 1.5 U	< 1.5 U
di-n-Butylphthalate	84-74-2	ug/L	< 3.7 U	< 3.7 U
di-n-Octylphthalate	117-84-0	ug/L	< 15 U	< 15 U
Diphenylamine	122-39-4	ug/L	< 2.5 U	< 2.5 U
Fluoranthene	206-44-0	ug/L	< 3.3 U	< 3.3 U
Fluorene	86-73-7	ug/L	< 3.7 U	< 3.7 U
Hexachlorobenzene	118-74-1	ug/L	< 1.6 U	< 1.6 U
Hexachlorobutadiene	87-68-3	ug/L	< 3.4 U	< 3.4 U
Hexachlorocyclopentadiene	77-47-4	ug/L	< 8.6 U	< 8.6 U
Hexachloroethane	67-72-1	ug/L	< 1.5 U	< 1.5 U
Indeno(1,2,3-c,d)pyrene	193-39-5	ug/L	< 8.6 U	< 8.6 U
Isophorone	78-59-1	ug/L	< 4.8 U	< 4.8 U
Naphthalene	91-20-3	ug/L	< 0.5 U	< 0.5 U
n-Nitroso-di-n-propylamine	621-64-7	ug/L	< 4.4 U	< 4.4 U
n-Nitrosodiphenylamine	86-30-6	ug/L	< 3 U	< 3 U
Pentachlorophenol	87-86-5	ug/L	< 0.042 U	< 0.042 U
Phenanthrene	85-01-8	ug/L	< 0.5 U	< 0.5 U
Phenol	108-95-2	ug/L	< 9.2 U	< 9.2 U
Pyrene	129-00-0	ug/L	< 2.8 U	< 2.8 U
VOC				
1,1,1-Trichloroethane	71-55-6	ug/L	< 0.5 U	< 0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/L	< 5 U	< 5 U
1,1,2-Trichloroethane	79-00-5	ug/L	< 1.2 U	< 1.2 U
1,1-Dichloroethane	75-34-3	ug/L	< 0.68 U	< 0.68 U
1,1-Dichloroethene	75-35-4	ug/L	< 0.5 U	< 0.5 U
1,2-Dichloroethane	107-06-2	ug/L	< 0.5 U	< 0.5 U
1,2-Dichloroethene (total)	540-59-0	ug/L	< 0.5 U	< 0.5 U
1,2-Dichloropropane	78-87-5	ug/L	< 0.5 U	< 0.5 U
2-Butanone	78-93-3	ug/L	< 6.4 U	< 6.4 U
2-Hexanone	591-78-6	ug/L	< 3.6 U	< 3.6 U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	< 3 U	< 3 U
Acetone	67-64-1	ug/L	< 13 U	< 13 U
Acetonitrile	75-05-8	ug/L	< 200 U	< 200 U
Benzene	71-43-2	ug/L	< 0.5 U	< 0.5 U

Table B-8
Historical Analytical Results for Groundwater Samples at Site 149/PICA-149
Picatinny Arsenal, New Jersey

		RI Site Name	149	149
		Location ID	I-149-MW-001	I-149-MW-002
		Sample Date	10/17/1996	10/17/1996
		Depth Interval	26.53 - 36.53	26.66 - 36.66
		Sample ID	149MW-1(19961017)	149MW-2(19961017)
		Sample Matrix	WG	WG
Chemical Name	**CAS No**	**Unit**		
VOC Contd.				
Bromodichloromethane	75-27-4	ug/L	< 0.59 U	< 0.59 U
Bromoform	75-25-2	ug/L	< 2.6 U	< 2.6 U
Bromomethane	74-83-9	ug/L	< 5.8 U	< 5.8 U
Carbon disulfide	75-15-0	ug/L	< 0.5 U	< 0.5 U
Carbon tetrachloride	56-23-5	ug/L	< 0.58 U	< 0.58 U
Chlorobenzene	108-90-7	ug/L	< 0.5 U	< 0.5 U
Chloroethane	75-00-3	ug/L	< 1.9 U	< 1.9 U
Chloroform	67-66-3	ug/L	< 0.5 U	< 0.5 U
Chloromethane	74-87-3	ug/L	< 3.2 U	< 3.2 U
cis-1,3-Dichloropropene	10061-01-5	ug/L	< 0.58 U	< 0.58 U
Dibromochloromethane	124-48-1	ug/L	< 0.67 U	< 0.67 U
Dichlorodifluoromethane	75-71-8	ug/L	< 6.9 U	< 6.9 U
Ethanol	64-17-5	ug/L	< 2000 U	< 2000 U
Ethyl benzene	100-41-4	ug/L	< 0.5 U	< 0.5 U
Isopropanol	67-63-0	ug/L	< 400 U	< 400 U
Methylene chloride	75-09-2	ug/L	< 2.3 U	< 2.3 U
Styrene	100-42-5	ug/L	< 0.5 U	< 0.5 U
tert-Butylalcohol	75-65-0	ug/L	< 500 U	< 500 U
Tetrachloroethene	127-18-4	ug/L	< 1.6 U	< 1.6 U
Toluene	108-88-3	ug/L	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	10061-02-6	ug/L	< 0.7 U	< 0.7 U
Trichloroethene	79-01-6	ug/L	< 0.5 U	< 0.5 U
Trichlorofluoromethane	75-69-4	ug/L	< 1.4 U	< 1.4 U
Vinyl acetate	108-05-4	ug/L	< 8.3 U	< 8.3 U
Vinyl chloride	75-01-4	ug/L	< 2.6 U	< 2.6 U
Xylenes	1330-20-7	ug/L	< 0.84 U	< 0.84 U
WetChem				
Ammonia	7664-41-7	ug/L	< 60 U	< 60 U
Chloride	16887-00-6	ug/L	27400	26300
Cyanide	57-12-5	ug/L	< 2.5 U	< 2.5 U
Fluoride	16984-48-8	ug/L	< 1230 U	< 1230 U
Nitrate/Nitrite	Nitrate/Nitrite	ug/L	24.4	< 10 U
Phosphate	14265-44-2	ug/L	16.5	16.3
Sulfate	14808-79-8	ug/L	< 10000 U	< 10000 U
Sulfide	18496-25-8	ug/L	< 50 U	< 50 U

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Appendix C
2016 Analytical Results

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-020-1-2	118-SS-020-4-5	118-SS-021-1-2	118-SS-022-1-2	118-SS-023-1-2
Field Sample ID:		D-118-SS-020-1-2-032916	D-118-SS-020-4-5-032916	D-118-SS-021-1-2-032916	D-118-SS-022-1-2-032916	D-118-SS-023-1-2-032916
Lab Sample ID:		1603269-14	1603269-15	1603269-18	1603269-22	1603269-02
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		5X	1X	2X	5X	2X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**					
Arsenic	MG/KG	**33**	**14**	**7.1**	**8.4**	**5.7**
Lead	MG/KG	**13**	**6.9**	**6.0**	**3.0**	**6.8**
Thallium	MG/KG	4.3 U	1.2 U	0.43 U	1.4 U	0.46 U

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
U = Compound was Not Detected
ID = Identification
QC = Quality Control

EPLN = Empirical Labs, Nashville, TN
MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-024-1-2	118-SS-025-1-2	118-SS-026-1-2	118-SS-027-1-2	118-SS-028-1-2
Field Sample ID:		D-118-SS-024-0-1-2-032916	D-118-SS-025-1-2-032916	D-118-SS-026-1-2-032916	D-118-SS-027-1-2-032916	D-118-SS-028-1-2-032916
Lab Sample ID:		1603269-06	1603269-10	1603269-26	1603269-30	1603269-34
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		2X	2X	5X	5X	5X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**					
Arsenic	MG/KG	**2.5**	**7.8**	**2.4 J**	**6.6**	**9.4**
Lead	MG/KG	**6.3**	**7.5**	**6.6**	**20**	**15**
Thallium	MG/KG	0.43 U	0.44 U	1.1 U	1.1 U	1.4 U

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
U = Compound was Not Detected
ID = Identification
QC = Quality Control

EPLN = Empirical Labs, Nashville, TN
MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-0000-DUP	118-SS-020-0-.5	118-SS-021-0-.5	118-SS-022-0-.5	118-SS-023-0-.5
Field Sample ID:		D-118-SS-0000-DUP-032916	D-118-SS-020-0-0.5-032916	D-118-SS-021-0-0.5-032916	D-118-SS-022-0-0.5-032916	D-118-SS-023-0-0.5-032916
Lab Sample ID:		1603269-37	1603269-13	1603269-17RE1	1603269-21	1603269-01
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		5X	5X	5X	5X	2X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**					
Arsenic	MG/KG	**31**	**5.3**	**25**	**47**	**8.1**
Lead	MG/KG	**34**	**9.0**	**57**	**48**	**11**
Thallium	MG/KG	1.7 U	1.3 U	1.6 U	1.8 U	0.55 U

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
U = Compound was Not Detected
ID = Identification
QC = Quality Control

EPLN = Empirical Labs, Nashville, TN
MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-024-0-.5	118-SS-025-0-.5	118-SS-026-0-.5	118-SS-027-0-.5	118-SS-028-0-.5
Field Sample ID:		D-118-SS-024-0-0.5-032916	D-118-SS-025-0-0.5-032916	D-118-SS-026-0-0.5-032916	D-118-SS-027-0-0.5-032916	D-118-SS-028-0-0.5-032916
Lab Sample ID:		1603269-05RE2	1603269-09	1603269-25	1603269-29	1603269-33
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		25X	2X	5X	5X	10X,5X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**					
Arsenic	MG/KG	**30**	**37**	**32**	**160**	**63**
Lead	MG/KG	**36**	**22**	**24**	**130**	**230**
Thallium	MG/KG	**9.6 J**	0.48 U	1.3 U	1.4 U	5.0 U

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
U = Compound was Not Detected
ID = Identification
QC = Quality Control
EPLN = Empirical Labs, Nashville, TN
MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-020-1-2	118-SS-021-1-2	118-SS-022-1-2	118-SS-023-1-2	118-SS-024-1-2
Field Sample ID:		D-118-SS-020-1-2-032916	D-118-SS-021-1-2-032916	D-118-SS-022-1-2-032916	D-118-SS-023-1-2-032916	D-118-SS-024-0-1-2-032916
Lab Sample ID:		1603269-14RE1	1603269-18RE1	1603269-22RE1	1603269-02RE1	1603269-06RE1
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Organochlorine Pesticides by Capillary GC	**Units**					
Dieldrin	MG/KG	0.039 UJ	0.0082 U	0.013 U	0.0094 U	0.0097 UJ
Heptachlor epoxide	MG/KG	0.039 UJ	0.0082 U	0.013 U	0.0094 U	0.0097 UJ

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
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MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-025-1-2	118-SS-026-1-2	118-SS-027-1-2	118-SS-028-1-2	118-SS-0000-DUP
Field Sample ID:		D-118-SS-025-1-2-032916	D-118-SS-026-1-2-032916	D-118-SS-027-1-2-032916	D-118-SS-028-1-2-032916	D-118-SS-0000-DUP-032916
Lab Sample ID:		1603269-10RE1	1603269-26RE1	1603269-30RE1	1603269-34RE1	1603269-37RE2
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Organochlorine Pesticides by Capillary GC	**Units**					
Dieldrin	MG/KG	0.0088 UJ	0.0084 U	0.011 U	0.013 U	0.013 UJ
Heptachlor epoxide	MG/KG	0.0088 UJ	0.0084 U	0.011 U	0.013 U	0.013 UJ

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118						
Location ID:		118-SS-020-0-.5	118-SS-021-0-.5	118-SS-022-0-.5	118-SS-023-0-.5	118-SS-024-0-.5
Field Sample ID:		D-118-SS-020-0-0.5-032916	D-118-SS-021-0-0.5-032916	D-118-SS-022-0-0.5-032916	D-118-SS-023-0-0.5-032916	D-118-SS-024-0-0.5-032916
Lab Sample ID:		1603269-13RE1	1603269-17RE2	1603269-21RE2	1603269-01RE1	1603269-05RE1
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Organochlorine Pesticides by Capillary GC	**Units**					
Dieldrin	MG/KG	0.012 U	0.016 UJ	0.016 UJ	0.014 UJ	0.012 U
Heptachlor epoxide	MG/KG	0.012 U	0.016 UJ	0.016 UJ	0.014 UJ	0.012 U

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 097 Sampling Event

Site Name: PICA-097 Site 118					
Location ID:		118-SS-025-0-.5	118-SS-026-0-.5	118-SS-027-0-.5	118-SS-028-0-.5
Field Sample ID:		D-118-SS-025-0-0.5-032916	D-118-SS-026-0-0.5-032916	D-118-SS-027-0-0.5-032916	D-118-SS-028-0-0.5-032916
Lab Sample ID:		1603269-09RE1	1603269-25RE1	1603269-29RE1	1603269-33RE1
Lab Name:		EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016	3/29/2016
Field QC:					
Analysis Information:		1X	1X	1X	1X
Organochlorine Pesticides by Capillary GC	**Units**				
Dieldrin	MG/KG	0.011 U	0.013 U	0.011 U	0.014 U
Heptachlor epoxide	MG/KG	0.011 U	0.013 U	0.011 U	0.014 U

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 131 Site 131 Sampling Event

Site Name: PICA-131 Site 131						
Location ID:		131-SS-14-1-2	131-SS-15-1-2	131-SS-16-1-2	131-SS-16-4-5	131-SS-17-1-2
Field Sample ID:		H-131-SS-14-1-2-033016	H-131-SS-15-1-2-033016	H-131-SS-16-1-2-033016	H-131-SS-16-4-5-033016	H-131-SS-17-1-2-033016
Lab Sample ID:		1604005-02	1604005-06	1604005-10	1604005-11	1604005-14
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016
Field QC:						
Analysis Information:		2X	2X	2X	1X	2X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**					
Arsenic	MG/KG	**8.0**	**12**	**80**	**7.8**	**25**

Notes:

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MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 131 Site 131 Sampling Event

Site Name: PICA-131 Site 131						
Location ID:		131-SS-17-4-5	131-SS-18-1-2	131-SS-19-1-2	131-SS-14-0-.5	131-SS-15-0-.5
Field Sample ID:		H-131-SS-17-4-5-033016	H-131-SS-18-1-2-033016	H-131-SS-19-1-2-033016	H-131-SS-14-0-0.5-033016	H-131-SS-15-0-0.5-033016
Lab Sample ID:		1604005-15RE1	1604005-18	1604005-22	1604005-01	1604005-05
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016
Field QC:						
Analysis Information:		5X	2X	2X	2X	2X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**					
Arsenic	MG/KG	**18**	**15**	**9.7**	**8.0**	**7.9**

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MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 131 Site 131 Sampling Event

Site Name: PICA-131 Site 131					
Location ID:		131-SS-16-0-.5	131-SS-17-0-.5	131-SS-18-0-.5	131-SS-19-0-0.5
Field Sample ID:		H-131-SS-16-0-0.5-033016	H-131-SS-17-0-0.5-033016	H-131-SS-18-0-0.5-033016	H-131-SS-19-0-0.5-033016
Lab Sample ID:		1604005-09	1604005-13	1604005-17	1604005-21
Lab Name:		EPLN	EPLN	EPLN	EPLN
Sample Date:		3/30/2016	3/30/2016	3/30/2016	3/30/2016
Field QC:					
Analysis Information:		2X	2X	2X	2X
Trace Metals by Inductively Coupled Plasma/Atomic Emission Spectrometry	**Units**				
Arsenic	MG/KG	**120**	**26**	**32**	**23**

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MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 131 Site 131 Sampling Event

Site Name: PICA-131 Site 131						
Location ID:		131-SS-14-1-2	131-SS-15-1-2	131-SS-16-1-2	131-SS-17-1-2	131-SS-18-1-2
Field Sample ID:		H-131-SS-14-1-2-033016	H-131-SS-15-1-2-033016	H-131-SS-16-1-2-033016	H-131-SS-17-1-2-033016	H-131-SS-18-1-2-033016
Lab Sample ID:		1604005-02	1604005-06	1604005-10	1604005-14	1604005-18
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**					
Benzo(a)anthracene	MG/KG	**0.0046 J**	**0.0025 J**	**0.030**	**0.036**	**3.0**
Benzo(a)pyrene	MG/KG	**0.0048 J**	**0.0030 J**	**0.057**	**0.059**	**2.4**
Benzo(b)fluoranthene	MG/KG	**0.020 J**	**0.0062 J**	**0.13**	**0.12**	**3.1**

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MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 131 Site 131 Sampling Event

Site Name: PICA-131 Site 131						
Location ID:		131-SS-18-4-5	131-SS-19-1-2	131-SS-14-0-.5	131-SS-15-0-.5	131-SS-16-0-.5
Field Sample ID:		H-131-SS-18-4-5-033016	H-131-SS-19-1-2-033016	H-131-SS-14-0-0.5-033016	H-131-SS-15-0-0.5-033016	H-131-SS-16-0-0.5-033016
Lab Sample ID:		1604005-19	1604005-22	1604005-01	1604005-05	1604005-09
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016
Field QC:						
Analysis Information:		1X	1X	2X	1X	2X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**					
Benzo(a)anthracene	MG/KG	0.0036 U	**0.013**	**0.021**	**0.024**	**0.10**
Benzo(a)pyrene	MG/KG	0.0036 U	**0.021**	**0.044**	**0.048**	**0.080**
Benzo(b)fluoranthene	MG/KG	0.0036 U	**0.042**	**0.022**	**0.14**	**0.17**

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 131 Site 131 Sampling Event

Site Name: PICA-131 Site 131				
Location ID:		131-SS-17-0-.5	131-SS-18-0-.5	131-SS-19-0-0.5
Field Sample ID:		H-131-SS-17-0-0.5-033016	H-131-SS-18-0-0.5-033016	H-131-SS-19-0-0.5-033016
Lab Sample ID:		1604005-13	1604005-17	1604005-21
Lab Name:		EPLN	EPLN	EPLN
Sample Date:		3/30/2016	3/30/2016	3/30/2016
Field QC:				
Analysis Information:		1X	1X	1X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**			
Benzo(a)anthracene	MG/KG	**0.048**	**0.20**	**0.22**
Benzo(a)pyrene	MG/KG	**0.055**	**0.22**	**0.25**
Benzo(b)fluoranthene	MG/KG	**0.10**	**0.31**	**0.35**

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-33-016-1-2	149-33-016-4-5	149-SS-009-3-4	149-SS-010-1-2	149-SS-010-4-5
Field Sample ID:		I-149-33-016-1-2-032916	I-149-33-016-4-5-032916	I-149-SS-009-3-4-032816	I-149-SS-010-1-2-032816	I-149-SS-010-4-5-032816
Lab Sample ID:		1603256-06	1603256-07	1603256-11	1603256-14	1603256-15
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/28/2016	3/28/2016	3/28/2016	3/28/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**					
Benzo(a)anthracene	MG/KG	**0.33**	**0.0020 J**	**0.090**	**0.21**	**0.025**
Benzo(a)pyrene	MG/KG	**0.34**	0.0036 U	**0.084**	**0.21**	**0.020**
Benzo(b)fluoranthene	MG/KG	**0.48**	0.0036 U	**0.12**	**0.27**	**0.027**
Dibenz(a,h)anthracene	MG/KG	**0.065**	0.0036 U	**0.016**	**0.037**	**0.0035 J**
Indeno(1,2,3-c,d)pyrene	MG/KG	**0.27**	0.0036 U	**0.065**	**0.15**	**0.014**

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-SS-011-1-2	149-SS-011-4-5	149-SS-012-1-2	149-SS-013-1-2	149-SS-013-4-5
Field Sample ID:		I-149-SS-011-1-2-032816	I-149-SS-011-4-5-032816	I-149-SS-012-1-2-032816	I-149-SS-013-1-2-032816	I-149-SS-013-4-5-032816
Lab Sample ID:		1603256-18	1603256-19	1603256-22	1603256-26	1603256-27
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/28/2016	3/28/2016	3/28/2016	3/28/2016	3/28/2016
Field QC:						
Analysis Information:		1X	1X	100X,10X	1X	1X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**					
Benzo(a)anthracene	MG/KG	**2.3**	**0.0022 J**	**27**	**0.67**	**0.0050 J**
Benzo(a)pyrene	MG/KG	**2.0**	0.0043 U	**36**	**0.64**	**0.0046 J**
Benzo(b)fluoranthene	MG/KG	**2.8**	0.0043 U	**74**	**0.90**	0.0039 U
Dibenz(a,h)anthracene	MG/KG	**0.36**	0.0043 U	**7.2**	**0.11**	0.0039 U
Indeno(1,2,3-c,d)pyrene	MG/KG	**1.5**	0.0043 U	**25**	**0.45**	**0.0049 J**

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-SS-014-1-2	149-SS-015-1-2	149-SS-015-4-5	149-SS-009-0-.5	149-SS-010-0-.5
Field Sample ID:		I-149-SS-014-1-2-032816	I-149-SS-015-1-2-032916	I-149-SS-015-4-5-032916	I-149-SS-009-0-0.5-032816	I-149-SS-010-0-0.5-032816
Lab Sample ID:		1603256-29	1603256-02	1603256-03	1603256-10	1603256-13
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/28/2016	3/29/2016	3/29/2016	3/28/2016	3/28/2016
Field QC:						
Analysis Information:		10X,1X	1X	1X	2X	2X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**					
Benzo(a)anthracene	MG/KG	**3.7**	**0.58**	**0.055**	**0.97**	**0.63**
Benzo(a)pyrene	MG/KG	**3.1**	**0.74**	**0.061**	**1.0**	**0.67**
Benzo(b)fluoranthene	MG/KG	**4.1**	**0.97**	**0.099**	**1.3**	**0.96**
Dibenz(a,h)anthracene	MG/KG	**0.51**	**0.15**	**0.010**	**0.19**	**0.13**
Indeno(1,2,3-c,d)pyrene	MG/KG	**2.1**	**0.61**	**0.045**	**0.74**	**0.50**

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-SS-011-0-.5	149-SS-012-0-.5	149-SS-012-4-5-	149-SS-013-0-.5	149-SS-014-0-.5
Field Sample ID:		I-149-SS-011-0-0.5-032816	I-149-SS-012-0-0.5-032816	I-149-SS-012-4-5-032816	I-149-SS-013-0-0.5-032816	I-149-SS-014-0-0.5-032816
Lab Sample ID:		1603256-17	1603256-21	1603256-23	1603256-25	1603256-28
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/28/2016	3/28/2016	3/28/2016	3/28/2016	3/28/2016
Field QC:						
Analysis Information:		1X	5X	1X	5X	2X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**					
Benzo(a)anthracene	MG/KG	**0.66**	**4.1**	0.0037 U	**9.2**	**1.1**
Benzo(a)pyrene	MG/KG	**0.69**	**6.2**	0.0037 U	**7.9**	**1.0**
Benzo(b)fluoranthene	MG/KG	**0.95**	**11**	0.0037 U	**11**	**1.4**
Dibenz(a,h)anthracene	MG/KG	**0.13**	**1.2**	0.0037 U	**1.3**	**0.19**
Indeno(1,2,3-c,d)pyrene	MG/KG	**0.52**	**4.4**	0.0037 U	**5.4**	**0.72**

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149				
Location ID:		149-SS-015-0-.5	149-SS-016-0-.5	149-SS-016-0-.5
Field Sample ID:		I-149-SS-015-0-0.5-032916	I-149-33-0000-DUP-032916	I-149-SS-016-0-0.5-032916
Lab Sample ID:		1603256-01	1603256-09	1603256-05
Lab Name:		EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016	3/29/2016
Field QC:			Field Duplicate	
Analysis Information:		1X	1X	1X
Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry	**Units**			
Benzo(a)anthracene	MG/KG	**0.18**	**0.12**	**0.35**
Benzo(a)pyrene	MG/KG	**0.21**	**0.15**	**0.41**
Benzo(b)fluoranthene	MG/KG	**0.34**	**0.23**	**0.76**
Dibenz(a,h)anthracene	MG/KG	**0.041**	**0.030**	**0.086**
Indeno(1,2,3-c,d)pyrene	MG/KG	**0.16**	**0.12**	**0.35**

Notes:

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-33-016-1-2	149-SS-009-3-4	149-SS-010-1-2	149-SS-011-1-2	149-SS-012-1-2
Field Sample ID:		I-149-33-016-1-2-032916	I-149-SS-009-3-4-032816	I-149-SS-010-1-2-032816	I-149-SS-011-1-2-032816	I-149-SS-012-1-2-032816
Lab Sample ID:		1603256-06	1603256-11	1603256-14	1603256-18	1603256-22
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/29/2016	3/28/2016	3/28/2016	3/28/2016	3/28/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Nitroaromatics and Nitramines by HPLC	**Units**					
2,4-Dinitrotoluene	MG/KG	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U

Notes:

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-SS-013-1-2	149-SS-014-1-2	149-SS-015-1-2	149-SS-009-0-.5	149-SS-010-0-.5
Field Sample ID:		I-149-SS-013-1-2-032816	I-149-SS-014-1-2-032816	I-149-SS-015-1-2-032916	I-149-SS-009-0-0.5-032816	I-149-SS-010-0-0.5-032816
Lab Sample ID:		1603256-26	1603256-29	1603256-02	1603256-10RE1	1603256-13RE1
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/28/2016	3/28/2016	3/29/2016	3/28/2016	3/28/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Nitroaromatics and Nitramines by HPLC	**Units**					
2,4-Dinitrotoluene	MG/KG	**1.8 J**	**0.36**	**0.085**	0.039 U	0.040 U

Notes:

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Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149						
Location ID:		149-SS-011-0-.5	149-SS-012-0-.5	149-SS-013-0-.5	149-SS-014-0-.5	149-SS-015-0-.5
Field Sample ID:		I-149-SS-011-0-0.5-032816	I-149-SS-012-0-0.5-032816	I-149-SS-013-0-0.5-032816	I-149-SS-014-0-0.5-032816	I-149-SS-015-0-0.5-032916
Lab Sample ID:		1603256-17	1603256-21RE1	1603256-25	1603256-28	1603256-01
Lab Name:		EPLN	EPLN	EPLN	EPLN	EPLN
Sample Date:		3/28/2016	3/28/2016	3/28/2016	3/28/2016	3/29/2016
Field QC:						
Analysis Information:		1X	1X	1X	1X	1X
Nitroaromatics and Nitramines by HPLC	**Units**					
2,4-Dinitrotoluene	MG/KG	0.039 U	0.039 U	**0.98 J**	0.039 U	0.039 U

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
U = Compound was Not Detected
ID = Identification
QC = Quality Control

EPLN = Empirical Labs, Nashville, TN
MG/KG = Milligrams per Kilogram

Chemistry Results
Picatinny Arsenal, New Jersey
PICA 149 Site 149 Sampling Event

Site Name: PICA-149 Site 149			
Location ID:		149-SS-016-0-.5	149-SS-016-0-.5
Field Sample ID:		I-149-33-0000-DUP-032916	I-149-SS-016-0-0.5-032916
Lab Sample ID:		1603256-09	1603256-05
Lab Name:		EPLN	EPLN
Sample Date:		3/29/2016	3/29/2016
Field QC:		Field Duplicate	
Analysis Information:		1X	1X
Nitroaromatics and Nitramines by HPLC	**Units**		
2,4-Dinitrotoluene	MG/KG	0.040 U	0.040 U

Notes:

J = Detected, Estimated
UJ = Compound was not detected and reporting limit is estimated
U = Compound was Not Detected
ID = Identification
QC = Quality Control
EPLN = Empirical Labs, Nashville, TN
MG/KG = Milligrams per Kilogram

Appendix D
Detailed Cost Tables of Responses Action Alternatives

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Table D-1
Projected Costs for Alternative SL-2 - Soil Cover with Land Use Controls at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,050	$2,050		
Subtotal:					$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.131	Acre	$50,000	$6,543		
3. Grub		15.0	ton	$167	$2,505		
4. Erosion and Sediment Controls		1.0	LS	$1,000	$1,000		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$15,748	$0	$0
III. SOIL COVER INSTALLATION							
1. Import Common Borrow		131.8	ton	$20	$2,636		
2. Import Topsoil		43.9	CY	$28	$1,229		
3. Backfill and Place Soil Cover		1.0	Day	$650	$650		
4. Labor/personnel		32.0	Hour	$207	$6,624		
5. Field Expense		3.0	Day	$585	$1,755		
6. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$14,894	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M (2.5% of soil cover installation)		30.0	Each	$372		$11,171	$4,600
Subtotal:					$0	$146,171	$60,400
SUBTOTAL (I, II, III, and IV)					$32,692	$146,171	$60,400
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$1,600		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$5,900		
4. Construction Management	12% of Capital Costs				$3,900		
5. Completion Report		1.0	LS	$15,000	$15,000		
6. Cost Contingency	25% of Capital Costs				$8,200		
7. O&M Contingency	15% of O&M Costs					$21,900	$9,100
Subtotal:					$54,600	$21,900	$9,100

Table D-1
Projected Costs for Alternative SL-2 - Soil Cover with Land Use Controls at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$87,000		
B. TOTAL ANNUAL COSTS					$168,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$70,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$157,000

CY - Cubic Yard
LS - Lump Sum
O&M - Operations and Maintenance
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance

Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-2
Projected Costs for Alternative SL-2 - Soil Cover with Land Use Controls at Site 131/PICA-131
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,600	$2,600		
Subtotal:					$2,600	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.067	Acre	$50,000	$3,329		
3. Grub		15.0	ton	$167	$2,505		
4. Erosion and Sediment Controls		1.0	LS	$500	$500		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$12,034	$0	$0
III. SOIL COVER INSTALLATION							
1. Import Common Borrow		187.8	ton	$20	$3,756		
2. Import Topsoil		62.6	CY	$28	$1,753		
3. Backfill and Place Soil Cover		1.0	Day	$650	$650		
4. Labor/personnel		32.0	Hour	$207	$6,624		
5. Field Expense		4.0	Day	$585	$2,340		
6. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$17,123	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M (2.5% of soil cover installation)		30.0	Each	$428		$12,842	$5,400
Subtotal:					$0	$147,842	$61,200
SUBTOTAL (I, II, III, and IV)					$31,757	$147,842	$61,200
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$1,600		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$5,700		
4. Construction Management	12% of Capital Costs				$3,800		
5. Completion Report		1.0	LS	$15,000	$15,000		
6. Cost Contingency	25% of Capital Costs				$7,900		
7. O&M Contingency	15% of O&M Costs					$22,200	$9,200
Subtotal:					$54,000	$22,200	$9,200

Table D-2
Projected Costs for Alternative SL-2 - Soil Cover with Land Use Controls at Site 131/PICA-131
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$86,000		
B. TOTAL ANNUAL COSTS					$170,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$70,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$156,000

CY - Cubic Yard
LS - Lump Sum
O&M - Operations and Maintenance
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance

Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-3
Projected Costs for Alternative SL-2 - Soil Cover with Land Use Controls at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,050	$2,050		
Subtotal:					$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.123	Acre	$50,000	$6,165		
3. Grub		30	ton	$167	$5,010		
4. Erosion and Sediment Controls		1.0	LS	$500	$500		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$17,375	$0	$0
III. SOIL COVER INSTALLATION							
1. Import Common Borrow		104.6	ton	$20	$2,092		
2. Import Topsoil		347.9	CY	$28	$9,741		
3. Backfill and Place Soil Cover		1.0	Day	$650	$650		
4. Labor/personnel		32.0	Hour	$207	$6,624		
5. Field Expense		3.0	Day	$585	$1,755		
6. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$22,862	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M (2.5% of soil cover installation)		30.0	Each	$572		$17,147	$7,100
Subtotal:					$0	$152,147	$62,900
SUBTOTAL (I, II, III, and IV)					$42,287	$152,147	$62,900
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$2,100		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$7,600		
4. Construction Management	12% of Capital Costs				$5,100		
5. Completion Report		1.0	LS	$15,000	$15,000		
6. Cost Contingency	25% of Capital Costs				$10,600		
7. O&M Contingency	15% of O&M Costs					$22,800	$9,500
Subtotal:					$60,400	$22,800	$9,500

Table D-3
Projected Costs for Alternative SL-2 - Soil Cover with Land Use Controls at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$103,000		
B. TOTAL ANNUAL COSTS					$175,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$72,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$175,000

CY - Cubic Yard
LS - Lump Sum
O&M - Operations and Maintenance
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance

Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-4
Projected Costs for Alternative SL-3 - Asphalt Cover with Institutional Controls at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,050	$2,050		
Subtotal:					$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.131	Acre	$50,000	$6,543		
3. Grub		15.0	ton	$167	$2,505		
4. Erosion and Sediment Controls		1.0	LS	$1,000	$1,000		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$15,748	$0	$0
III. ASPHALT COVER INSTALLATION							
1. Excavation of Sub-base		1.0	Day	$650	$650		
2. Transportation and Disposal of Excavated Soil		141.2	ton	$167	$23,580		
3. Installation of Asphalt Cap		2543.0	SF	$12	$30,516		
4. Waste Characterization		1.0	each	$770	$770		
5. Labor/personnel		32.0	Hour	$207	$6,624		
6. Field Expense		3.0	Day	$585	$1,755		
7. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$65,895	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M (5.0% of asphalt cover installation)		30.0	Each	$3,295		$98,843	$41,000
Subtotal:					$0	$233,843	$96,800
SUBTOTAL (I, II, III, and IV)					$83,693	$233,843	$96,800
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$4,200		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$15,100		
4. Construction Management	12% of Capital Costs				$10,000		
5. Completion Report		1.0	LS	$20,000	$20,000		
6. Cost Contingency	25% of Capital Costs				$20,900		
7. O&M Contingency	15% of O&M Costs					$35,100	$14,600
Subtotal:					$90,200	$35,100	$14,600

Table D-4
Projected Costs for Alternative SL-3 - Asphalt Cover with Institutional Controls at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$174,000		
B. TOTAL ANNUAL COSTS					$269,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$111,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$285,000

CY - Cubic Yard
LS - Lump Sum
SF - Square Foot
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance
O&M - Operations and Maintenance

Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-5
Projected Costs for Alternative SL-3 - Asphalt Cover with Institutional Controls at Site 131/PICA-131
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,600	$2,600		
Subtotal:					$2,600	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.067	Acre	$50,000	$3,329		
3. Grub		15.0	ton	$167	$2,505		
4. Erosion and Sediment Controls		1.0	LS	$500	$500		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$12,034	$0	$0
III. ASPHALT COVER INSTALLATION							
1. Excavation of Sub-base		1.0	Day	$650	$650		
2. Transportation and Disposal of Excavated Soil		187.8	ton	$167	$31,363		
3. Installation of Asphalt Cap		3380.0	SF	$12	$40,560		
4. Waste Characterization		1.0	each	$770	$770		
5. Labor/personnel		32.0	Hour	$207	$6,624		
6. Field Expense		4.0	Day	$585	$2,340		
7. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$84,307	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M (5.0% of asphalt cover installation)		30.0	Each	$4,215		$126,460	$52,500
Subtotal:					$0	$261,460	$108,300
SUBTOTAL (I, II, III, and IV)					$98,941	$261,460	$108,300
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$4,900		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$17,800		
4. Construction Management	12% of Capital Costs				$11,900		
5. Completion Report		1.0	LS	$20,000	$20,000		
6. Cost Contingency	25% of Capital Costs				$24,700		
7. O&M Contingency	15% of O&M Costs					$39,200	$16,300
Subtotal:					$99,300	$39,200	$16,300

Table D-5
Projected Costs for Alternative SL-3 - Asphalt Cover with Institutional Controls at Site 131/PICA-131
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$198,000		
B. TOTAL ANNUAL COSTS					$301,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$125,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$323,000

CY - Cubic Yard
LS - Lump Sum
SF - Square Foot
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance
O&M - Operations and Maintenance

Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-6
Projected Costs for Alternative SL-3 - Asphalt Cover with Institutional Controls at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,050	$2,050		
Subtotal:					$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.123	Acre	$50,000	$6,165		
3. Grub		30.0	ton	$167	$5,010		
4. Erosion and Sediment Controls		1.0	LS	$500	$500		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$17,375	$0	$0
III. ASPHALT COVER INSTALLATION							
1. Excavation of Sub-base		1.0	Day	$650	$650		
2. Transportation and Disposal of Excavated Soil		104.6	ton	$167	$17,468		
3. Installation of Asphalt Cap		1883.0	SF	$12	$22,596		
4. Waste Characterization		1.0	each	$770	$770		
5. Labor/personnel		40.0	Hour	$207	$8,280		
6. Field Expense		5.0	Day	$585	$2,925		
7. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$54,689	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M (5.0% of asphalt cover installation)		30.0	Each	$2,734		$82,034	$33,700
Subtotal:					$0	$217,034	$89,500
SUBTOTAL (I, II, III, and IV)					$74,114	$217,034	$89,500
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$3,700		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$13,300		
4. Construction Management	12% of Capital Costs				$8,900		
5. Completion Report		1.0	LS	$20,000	$20,000		
6. Cost Contingency	25% of Capital Costs				$18,500		
7. O&M Contingency	15% of O&M Costs					$32,600	$13,400
Subtotal:					$84,400	$32,600	$13,400

Table D-6
Projected Costs for Alternative SL-3 - Asphalt Cover with Institutional Controls at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$159,000		
B. TOTAL ANNUAL COSTS					$250,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$103,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$262,000

CY - Cubic Yard
LS - Lump Sum
SF - Square Foot
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance
O&M - Operations and Maintenance

Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-7

Projected Costs for Alternative SL-4 - Removal, Off-site Disposal, and Land Use Controls at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Item		Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS							
1. Land Use Controls		1.0	LS	$2,050	$2,050		
Subtotal:					$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION							
1. Mobilization/Demobilization		1.0	LS	$1,000	$1,000		
2. Clear and Chip		0.131	Acre	$50,000	$6,543		
3. Grub		15	ton	$167	$2,505		
4. Erosion and Sediment Controls		1.0	LS	$1,000	$1,000		
5. Surveying		1.0	Day	$1,400	$1,400		
6. MEC (UXO)		1.0	Day	$2,800	$2,800		
7. Decontamination Controls		1.0	LS	$500	$500		
Subtotal:					$15,748	$0	$0
III. SOIL EXCAVATION AND REMOVAL							
1. Excavation of soil		1.0	Day	$650	$650		
2. Transportation and Disposal of Excavated Soil		377.1	ton	$167	$62,976		
3. Import Common Borrow		306.4	ton	$20	$6,128		
4. Import Topsoil		47.1	CY	$28	$1,319		
5. Backfill and Place Soil Cover		2.0	Day	$650	$1,300		
6. Waste Characterization		1.0	each	$770	$770		
7. Labor/personnel		32.0	Hour	$207	$6,624		
8. Field Expense		4.0	Day	$585	$2,340		
9. Site Restoration		1.0	LS	$2,000	$2,000		
Subtotal:					$84,107	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW							
1. Annual Inspection and Reporting		30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review		6.0	Each	$15,000		$90,000	$37,200
3. O&M		30.0	Each	$250		$7,500	$3,100
Subtotal:					$0	$142,500	$58,900
SUBTOTAL (I, II, III, and IV)					$101,905	$142,500	$58,900
V. IMPLEMENTATION Costs							
1. Administration and Legal	5% of Capital Costs				$5,100		
2. Remedial Design		1.0	LS	$20,000	$20,000		
3. Procurement	18% of Capital Costs				$18,300		
4. Construction Management	12% of Capital Costs				$12,200		
5. Completion Report		1.0	LS	$20,000	$20,000		
6. Cost Contingency	25% of Capital Costs				$25,500		
7. O&M Contingency	15% of O&M Costs					$21,400	$8,900
Subtotal:					$101,100	$21,400	$8,900

Table D-7

Projected Costs for Alternative SL-4 - Removal, Off-site Disposal, and Land Use Controls at Site 118/PICA-097
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$203,000		
B. TOTAL ANNUAL COSTS					$164,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$68,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$271,000

CY - Cubic Yard
LF - Linear Foot
LS - Lump Sum
SY - Square Yard
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance
O&M - Operations and Maintenance

Sample depths, as estimated for costing purposes, were by individual excavation area, and based on historical and pre-design soil data. Estimated depths are shown for each area in Figure 8.
Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-8
Projected Costs for Alternative SL-4 - Removal, Off-site Disposal, and Land Use Controls at Site 131/PICA-131
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS						
1. Land Use Controls	1.0	LS	$2,050	$2,050		
Subtotal:				$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION						
1. Mobilization/Demobilization	1.0	LS	$1,000	$1,000		
2. Clear and Chip	0.067	Acre	$50,000	$3,329		
3. Grub	15	ton	$167	$2,505		
4. Erosion and Sediment Controls	1.0	LS	$500	$500		
5. Surveying	1.0	Day	$1,400	$1,400		
6. MEC (UXO)	1.0	Day	$2,800	$2,800		
7. Decontamination Controls	1.0	LS	$500	$500		
Subtotal:				$12,034	$0	$0
III. SOIL EXCAVATION AND REMOVAL						
1. Excavation of soil	1.0	Day	$650	$650		
2. Transportation and Disposal of Excavated Soil	578.3	ton	$167	$96,576		
3. Import Common Borrow	323.0	ton	$20	$6,460		
4. Import Topsoil	62.6	CY	$28	$1,753		
5. Backfill and Place Soil Cover	2.0	Day	$650	$1,300		
6. Waste Characterization	1.0	each	$770	$770		
7. Labor/personnel	40.0	Hour	$207	$8,280		
8. Field Expense	5.0	Day	$585	$2,925		
9. Site Restoration	1.0	LS	$2,000	$2,000		
Subtotal:				$120,714	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW						
1. Annual Inspection and Reporting	30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review	6.0	Each	$15,000		$90,000	$37,200
3. O&M	30.0	Each	$250		$7,500	$3,100
Subtotal:				$0	$142,500	$58,900
SUBTOTAL (I, II, III, and IV)				$134,798	$142,500	$58,900
V. IMPLEMENTATION Costs						
1. Administration and Legal (5% of Capital Costs)				$6,700		
2. Remedial Design	1.0	LS	$20,000	$20,000		
3. Procurement (18% of Capital Costs)				$24,300		
4. Construction Management (12% of Capital Costs)				$16,200		
5. Completion Report	1.0	LS	$20,000	$20,000		
6. Cost Contingency (25% of Capital Costs)				$33,700		
7. O&M Contingency (15% of O&M Costs)					$21,400	$8,900
Subtotal:				$120,900	$21,400	$8,900

Table D-8
Projected Costs for Alternative SL-4 - Removal, Off-site Disposal, and Land Use Controls at Site 131/PICA-131
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$256,000		
B. TOTAL ANNUAL COSTS					$164,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$68,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$324,000

CY - Cubic Yard
LF - Linear Foot
LS - Lump Sum
SY - Square Yard
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance
O&M - Operations and Maintenance

Sample depths, as estimated for costing purposes, were by individual excavation area, and based on historical and pre-design soil data.
Estimated depths are shown for each area in Figure 9.
Present worth is calculated using 7.0% interest in 2014 dollars.

Table D-9
Projected Costs for Alternative SL-4 - Removal, Off-site Disposal, and Land Use Controls at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
I. ADMINISTRATIVE ACTIONS						
1. Land Use Controls	1.0	LS	$2,050	$2,050		
Subtotal:				$2,050	$0	$0
II. GENERAL ACTIONS/SITE PREPARATION						
1. Mobilization/Demobilization	1.0	LS	$1,000	$1,000		
2. Clear and Chip	0.123	Acre	$50,000	$6,165		
3. Grub	30.0	ton	$167	$5,010		
4. Erosion and Sediment Controls	1.0	LS	$500	$500		
5. Surveying	1.0	Day	$1,400	$1,400		
6. MEC (UXO)	1.0	Day	$2,800	$2,800		
7. Decontamination Controls	1.0	LS	$500	$500		
Subtotal:				$17,375	$0	$0
III. SOIL EXCAVATION AND REMOVAL						
1. Excavation of soil	1.0	Day	$650	$650		
2. Transportation and Disposal of Excavated Soil	327.8	ton	$167	$54,743		
3. Import Common Borrow	183.7	ton	$20	$3,674		
4. Import Topsoil	34.9	CY	$28	$977		
5. Backfill and Place Soil Cover	2.0	Day	$650	$1,300		
6. Waste Characterization	1.0	each	$770	$770		
7. Labor/personnel	40.0	Hour	$207	$8,280		
8. Field Expense	5.0	Day	$585	$2,925		
9. Site Restoration	1.0	LS	$2,000	$2,000		
Subtotal:				$75,319	$0	$0
IV. O&M, ANNUAL INSPECTION AND FIVE-YEAR REVIEW						
1. Annual Inspection and Reporting	30.0	Each	$1,500		$45,000	$18,600
2. Five-Year Review	6.0	Each	$15,000		$90,000	$37,200
3. O&M	30.0	Each	$250		$7,500	$3,100
Subtotal:				$0	$142,500	$58,900
SUBTOTAL (I, II, III, and IV)				$94,744	$142,500	$58,900
V. IMPLEMENTATION Costs						
1. Administration and Legal (5% of Capital Costs)				$4,700		
2. Remedial Design	1.0	LS	$20,000	$20,000		
3. Procurement (18% of Capital Costs)				$17,100		
4. Construction Management (12% of Capital Costs)				$11,400		
5. Completion Report	1.0	LS	$20,000	$20,000		
6. Cost Contingency (25% of Capital Costs)				$23,700		
7. O&M Contingency (15% of O&M Costs)					$21,400	$8,900
Subtotal:				$96,900	$21,400	$8,900

Table D-9
Projected Costs for Alternative SL-4 - Removal, Off-site Disposal, and Land Use Controls at Site 149/PICA-149
Picatinny Arsenal, New Jersey

Item	Quantity	Units	Unit Cost	Capital Cost	Annual O&M Cost	Present Worth Cost
A. TOTAL CAPITAL COSTS				$192,000		
B. TOTAL ANNUAL COSTS					$164,000	
C. TOTAL PRESENT WORTH OF ANNUAL COSTS						$68,000
TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)						$260,000

CY - Cubic Yard
LF - Linear Foot
LS - Lump Sum
SY - Square Yard
MEC = Munitions and Explosives of Concern
UXO - Unexploded Ordnance
O&M - Operations and Maintenance

Sample depths, as estimated for costing purposes, were by individual excavation area, and based on historical and pre-design soil data.
Estimated depths are shown for each area in Figure 10.
Present worth is calculated using 7.0% interest in 2014 dollars.

Appendix E
Mr. Glaab's Complete Comment Letter

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October 9, 2014
Michael Glaab
PAERAB Community Representative (Jefferson Twp.)
1 Springbrook Terrace
Lake Hopatcong, NJ 07849

Mr. Ted Gabel
Environmental Affairs Division
U.S. Army Installation Management Agency
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Building 319
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RE: Picatinny Arsenal – **Final 3 Site Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**
US Army / Arcadis presentation during 09/11/2014 Public Hearing

Dear Mr. Gabel:

On September 11, 2014 I had attended the US Army / Arcadis public presentation of the proposed plan (PP) for sites **118**, **131** and **149** at Picatinny Arsenal. It was stated during that presentation that the army's currently preferred course of action for this group of sites is to excavate its principal contaminants sufficiently to achieve conformance with the state of New Jersey's cleanup standards - with the unfortunate exception of manganese. The principal contaminants are itemized on page 6 of the PP as the following:

Table 2

Site Specific Cleanup Goals

CONTAMINANT OF CONCERN

SITE			CLEANUP Goal (mg/kg) mg/kg – milligrams per kilogram
Site 118/PICA-097	-	Arsenic	19
		Dieldrin (pesticide used in the 1970's)	0.2
		Heptochlor epoxide	0.3
		Lead	800
		Manganese	23,000 (USEPA IRSL value)
		Thallium	79
Site 131/PICA-131	-	Arsenic	19
		benzo(a)anthracene,	2
		benzo(a)pyrene,	0.2
		benzo(b)fluoranthene,	2
Site 149/PICA-149	-	2,4-DNT	3
		benzo(a)anthracene,	2
		benzo(a)pyrene,	0.2
		benzo(b)fluoranthene,	2
		dibenz(a,h)anthracene	0.2
		indeno(1,2,3-c,d)pyrene	2

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refer to page 9 of the PDF file: **Final 3 Site Proposed Plan 2014 08 26.pdf**
page 6 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

I. CONTAMINANTS

"Principal threat wastes are identified in accordance with the NCP (40 Code of Federal Regulations Part 300.430(a)(1)(iii)) and USEPA guidance (Office of Solid Waste and Emergency Response 9380.3-06FS). Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or that would present a significant risk to human health or to the environment should exposure occur. There is no fixed threshold level of toxicity or risk level that is used to define principal threats. However, a general rule of thumb is to consider a principal threat as those source materials with toxicity and mobility characteristics that combine to pose a potential risk several orders of magnitude greater than the risk level that is acceptable for the current or reasonably anticipated future land use, given realistic exposure scenarios."

page 7 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 4 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

Table 2 of the PP depicts Thallium and Manganese as the principal onsite threat drivers at Site 118.

"…The noncarcinogenic hazard is less than 1, except for industrial/research worker and construction/excavation worker site use which attained hazard index (HI) values of 10 and 86 respectively, both driven by thallium and manganese;…"

pages 7 and 8 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
pages 4 and 5 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149**

a. As for Thallium, it should be noted that Thallium forms an oxide when exposed to air. In the presence of water it forms a hydroxide. This element and its compounds are toxic.

THALLIUM "The element and its compounds are toxic and should be carefully handled. Contact of the metal with the skin is dangerous, and when melting the metal, adequate ventilation should be provided… Thallium sulfate is widely employed as a rodenticide and ant killer. It is odorless and tasteless, giving no warning of its presence."

page **B-33** of the CRC Handbook of Chemistry and Physics 53rd. Edition.

b. The PDF file elaborates about manganese with the following:

"…the preferred RA described herein does eliminate exposure to soils with contaminant concentrations above New Jersey NRDCSRS, with the exception of manganese, where an alternative clean up goal has been accepted by the USEPA. Because New Jersey NRDCSRS are recognized as ARARs, NJDEP approval of the preferred RA is expected, and will be further evaluated in the ROD following the public comment period."

page 13 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 10 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149**

c. Although asbestos is not included in the **CONTAMINANTS OF CONCERN** section **(Table 2)** that particular substance is specifically mentioned in the following paragraph on page 3 of the PP. That page unequivocally references the onsite presence, whether past or present, of asbestos:

"Site 131 is approximately 1.2 acres in size. Building 266, a former ordnance manufacturing facility (Site 131), was originally constructed in 1903 and has a concrete foundation, brick piers, brick load-bearing walls with four truck-loading dock doors, and a corrugated **asbestos** roof. Building 266 served as an explosives production facility from the time of its construction until the early 1950s. Explosives production ceased here sometime before 1953 when the building was converted to its current use as a wind tunnel research facility."

Is asbestos currently present onsite? Presumably asbestos was excluded from Table 2 of the PP because of its relatively minimal presence at Site 131/PICA-131. But even if the presence of asbestos is relatively minimal that does not necessarily justify excluding it from the table. Why was asbestos excluded? If asbestos currently exists onsite is a removal action anticipated?

d. At Site 131/PICA-131 the Phase II ERA had identified elevated concentrations of Polynuclear (or polycyclic) Aromatic Hydrocarbon (PAH), arsenic, and **beryllium** :

"Based on the risk assessments performed for this site for current and reasonably anticipated future use:

- The carcinogenic risk is within or less than the generally acceptable range of 1E-04 and 1E-06, except for industrial/research work site use which attained a carcinogenic risk value of 2E-4 driven by arsenic;
- The noncarcinogenic hazard is less than 1;
- Lead is not a concern at this site; and
- The Phase II ERA identified elevated concentrations of Polynuclear (or polycyclic) Aromatic Hydrocarbon (PAH), arsenic, and **beryllium** however results from a toxicity bioassay and environmental effects quotients study deem there is minimal risk to populations of terrestrial receptors."

page 8 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 5 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

Although the PP reassures that there is minimal risk to the populations of terrestrial receptors the presence of a toxic substance such as beryllium is not reassuring :

BERYLLIUM **"…**Beryllium…is used in nuclear reactors as a reflector or moderator for it has a low thermal neutron absorption cross section. … The oxide has a very high melting point and is also used in nuclear work and ceramic applications. **Beryllium and its salts are toxic** and should be handled with the greatest of care. Beryllium and its compounds should not be tasted … The metal, its alloys, and its salts can be handled safely if certain work codes are observed, but no attempt should be made to work with beryllium before becoming familiar with proper safeguards…."

page **B-7** of the CRC Handbook of Chemistry and Physics 53rd. Edition.

It must be noted that beryllium is not included in Table 2 of the PP. Presumably beryllium was excluded from Table 2 of the PP because of its relatively minimal presence at Site 131/PICA-131. Why was beryllium excluded? Even if the presence of beryllium is relatively minimal that does not necessarily justify excluding mention of its presence in the table. Is a removal action of beryllium anticipated?

e. Although uranium is not included in the **CONTAMINANTS OF CONCERN** section **(Table 2)** that particular substance is specifically mentioned in the following paragraph on page 3 of the PP. That page unequivocally references the onsite presence of Uranium, whether in the past or present is unclear:

"Materials known to be used in wind tunnel operations included compressor oils, lubricating oils, and **uranium**-containing valves and gauges. PTA personnel indicated that operation of the wind tunnel has resulted in the generation and dispersion of mercury condensate in and around the wind tunnel exhaust area. The mercury release to soil was the subject of a previous investigation and removal in 1992. … Oil-contaminated wastewater generated by wind tunnel activities at Building 266 was conveyed to an oil-water separator and discharged to Bear Swamp Brook (BSB) in the past. The oil-water separator is known to have malfunctioned on at least one occasion, and untreated wastewater was discharged directly to BSB. According to PTA personnel, wastewater from the building presently discharges to the sanitary sewer while all remaining wastes are disposed of off-site."

page 6 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 3 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

URANIUM "In air, the metal becomes coated with a layer of oxide. … Natural uranium is sufficiently radioactive to expose a photographic plate in an hour or so. … Uranium is of great importance as a nuclear fuel. U^{238} can be converted into fissionable plutonium …U^{235} is of even greater importance, for it is the key to the utilization of uranium. … so fissionable with slow neutrons that a self-sustaining fission chain reaction can be made to occur in a reactor constructed from natural uranium and a suitable moderator. … U^{235} … may be used as a nuclear fuel. … Uranium metal is used for x-ray targets for production of high-energy x-rays; … **Uranium and its compounds are highly toxic,** both from a chemical and radiological standpoint. Finely divided uranium metal, being pyrophoric, presents a fire hazard…. "

page **B-36** of the CRC Handbook of Chemistry and Physics 53rd. Edition.

Are uranium isotopes and/or its radioactive decay byproducts present onsite? This potential issue is problematic since it is related to other factors such as the use of the hazardous waste pressurized incinerator situated at the arsenal. Additional information regarding this topic is requested – specifically whether or not the above referred to incinerator will be used to dispose of radioactive substances.

"The Army's Preferred RA for the three sites discussed in this PP is:

- SL-4 - Removal, Off-Site Disposal, and Land Use Controls (LUCs)

The preferred RA presented in this PP was selected over other RAs because it provides the best combination of primary balancing attributes, is protective of human health and the environment meeting the CERCLA threshold criteria,"

page 5 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 2 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

That the army asserts that it will achieve conformance with the state of New Jersey's cleanup standards for most of the principal contaminants is reassuring. After all, excavation and disposal of contaminants is preferable to merely relying on the environment to slowly and naturally degrade contaminants into their less harmful constituents: monitored natural attenuation (MNA). However, it is essential that the excavated materials be safely transported from the arsenal to a properly accredited and maintained facility elsewhere that is specifically designed to safely accommodate those contaminants.

II. GROUNDWATER

It is disappointing that the preferred alternative doesn't include direct treatment of any of the contaminants, other than excavation. In particular, it is unfortunate that groundwater contamination is not addressed in this PP :

"As concluded in the risk assessment … for the Sites, … groundwater itself is not a principal threat because it is considered a nonsource material."

page 7 of the PDF file: **Final 3 Site Proposed Plan 2014 08 26.pdf**
page 4 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

Bu then, the PP does explain that groundwater concerns are addressed separately in other documents and proposed plans. Therefore, I will reserve my judgment on this matter and refrain from commenting further in this document about groundwater concerns except for the following observations :

a. Considering the nature of the past activities at Site 131, as described below, it is only reasonable and prudent to take all necessary and appropriate measures in conformity with legal statutes to minimize the possibility of water contamination due to the presence at Site 131 of contaminants :

"Site 131 is approximately 1.2 acres in size. Building 266, a former ordnance manufacturing facility (Site 131), was originally constructed in 1903 and has a concrete foundation, brick piers, brick load-bearing walls with four truck-loading dock doors, and a corrugated asbestos roof. Building 266 served as an explosives production facility from the time of its construction until the early 1950s. Explosives production ceased here sometime before 1953 when the building was converted to its current use as a wind tunnel research facility. The wind tunnel research facility has been used to simulate and study the flight characteristics of small projectiles. … "

The PP's description of the past activities at Site 131 continues with the following statements :

> "The types of material used and/or wastes generated from explosives production operations are not known, except for Class 7 pyrotechnic compositions. However, based on the knowledge of explosives operations in Area H, materials used and/or derivative wastes generated in appreciable quantities would likely have included scrap explosives waste and possibly pyrotechnics, solvent contaminated rags, and explosives-contaminated wastewater. All of the waste materials, except for the explosives-contaminated wastewater, were generally placed in red cans and disposed of at the PTA Burning Ground.
>
> Materials known to be used in wind tunnel operations included compressor oils, lubricating oils, and uranium-containing valves and gauges. PTA personnel indicated that operation of the wind tunnel has resulted in the generation and dispersion of mercury condensate in and around the wind tunnel exhaust area. The mercury release to soil was the subject of a previous investigation and removal …"

page 6 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 3 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

b. It is stated on page 4 of the PP that "…groundwater at Sites 131 and 118 is not addressed in this PP because groundwater at these sites is addressed through the Mid-Valley ROD (Army, 2012) and the Area D ROD (Army, 2004a), respectively." The Area D ROD (Army, 2004a) is a separate document. The only site for which surface water and sediment samples appear to have been collected for this PP was Site 118 and it is explained on the same page of the PP that "…these media are addressed through the Green Pond Brook/Bear Swamp Brook ROD (Army, 2004b)." In addition, the PP also specifies on page 4 that "…there were no groundwater exceedances at Site 149…" and that therefore groundwater concerns for Site 149 were not included in the risk evaluation for that site.

   It would be more reassuring had additional water and sediment samples been taken and analyzed.

c. The PP asserts that there were no groundwater LOC exceedances at Site 149 and that therefore its groundwater was not addressed in the risk evaluation. However, Site 149 is located along the southeast shore of Picatinny Lake. Its surface water and sediments are addressed in the Lakes Feasibility Study (FS). It is acknowledged in the PP that due to its proximity to Picatinny Lake, surface water runoff and soil erosion from Site 149 has the potential to affect that lake's surface water and/or sediment quality :

> "Site 149/PICA-149 is located along the southeast shore of Picatinny Lake. Given the proximity to Picatinny Lake, surface water runoff or soil erosion at this site may have the potential to affect surface water or sediment quality of Picatinny Lake. Picatinny Lake surface water and sediments are addressed in the Lakes ***Feasibility Study*** (FS) (ARCADIS U.S., Inc. [ARCADIS], 2014a), which indicated that there are no unacceptable risks on a lakewide basis. The site covers 0.8 acre of forested habitat. Building 541 was a rectangular structure formerly located on the eastern shore of Picatinny Lake. The building was constructed in 1943 to perform the water drying process to harden explosive powder grains. Operations ceased in the mid-1950s, and the building was used to house two Plymouth gas locomotives during the 1960s. Building 541 was demolished in 1983."

page 6 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
page 3 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

That there are no unacceptable risks on a lakewide basis is an encouraging assertion. But, considering the nature of the past activities at Site 149, in the vicinity of Building 541, as described in part below, it is prudent to address the issues of surface water runoff and soil erosion from Site 149 into Picatinny Lake:

> "During its use as a water-drying process facility, Building 541 received shipments of explosive powder transported by railroad from Building 533. The explosive powder was unloaded inside the building. An elevator was used to hoist the powder to 12 wooden cypress tanks, where the water drying process hardened the grains and removed excess solvents. The water and powder mixture was discharged from the tanks directly into carts. These carts moved on a small interior tracking system that ran the length of the building. Screening to remove foreign objects or large clumps concluded this phase of processing.
>
> Picatinny Arsenal personnel reported that a vat in Building 541 ruptured, causing liquid containing propellant to leak onto the building floor and to the outside area. The solution was reported to be singlebase propellant grains dissolved in solvents. The energetic compounds were nitrocellulose and/or nitroglycerine. The solvents were ether, alcohol, and/or acetone."

pages 6 to 7 of the **Final 3 Site Proposed Plan 2014 08 26.pdf** (PDF file)
pages 3 to 4 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

d. It behooves one to recall that Picatinny Arsenal is located on top of large water aquifers and that there is a steady but slow outward movement of groundwater from beneath the arsenal. In the area immediately adjacent to Route 15 that outward direction of flow tends to be towards the south. Water borne contaminants, possibly emanating from the arsenal, have in the past been detected in water samples taken alongside Route 15. Indeed, this was apparently a significant factor contributing to delays in the approving of a large nearby proposed real estate development between Routes 15 and 80. During the tenure of the former Congressman Dean Gallo it had been necessary to provide water to residents and businesses then situated along that portion of Route 15 near the arsenal and the NJDOT facility.

It is imperative that due diligence be taken to assure that water quality standards be properly maintained to assure the health, safety and welfare of the citizenry adjacent to the arsenal – and also that of all of those individuals who reside on the arsenal and/or labor there.

Therefore, I will reserve my judgment about groundwater concerns and await clarification while I examine the other relevant documents concerned with groundwater at the arsenal.

III. DECISION and RESERVATIONS

Since the currently preferred alternative involves excavation and removal of contaminated soil I tentatively approve the proposed plan – with the following reservations which I will enumerate below. My reservations - and the reasons for them are the following:

1. The army had selected a proposal, several years past, to excavate a relatively sizeable amount of contaminated soil from a site. This particular proposal had been endorsed by all of the community members of the PAERAB. Unfortunately, more than 6 months later the board was informed that the army had unilaterally canceled that proposal, much to the disappointment of the community members. Minimal clarification of the reasons for the cancellation was provided. Presumably any funds that had been dedicated to this removal action were allocated elsewhere.

2. The failure of this PP to *directly* address water contamination concerns.

   However, because water contamination concerns are addressed elsewhere and since contaminated soil is to be excavated this particular concern does not, in my opinion, justify opposing the PP.

3. With respect to Manganese, an alternative clean up goal has been accepted by the USEPA. Because New Jersey NRDCSRS are now recognized as ARARs, NJDEP's approval of the preferred RA is expected to be forthcoming after further evaluation subsequent to the public comment period's conclusion.

   "State Acceptance

   During NJDEP's review of the Draft FS, NJDEP stated concerns with alternatives that did not address soils with concentration of contaminants above the New Jersey NRDCSRS. The RAs presented in the Final FS and the preferred RA described herein does eliminate exposure to soils with contaminant concentrations above New Jersey NRDCSRS, with the exception of manganese, where an alternative clean up goal has been accepted by the USEPA. Because New Jersey NRDCSRS are recognized as ARARs, NJDEP approval of the preferred RA is expected, and will be further evaluated in the ROD following the public comment period."

page 13 of the PDF file: **Final 3 Site Proposed Plan 2014 08 26.pdf**
page 10 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

Due to insufficient information having as yet been provided regarding the alternative cleanup goal and approach for Manganese, I reserve judgment as to their appropriateness and efficacy. Accordingly, I request additional, and more specific, clarification. Prudence requires that sufficient excavation occur to achieve conformity to responsible and safe standards for manganese.

> "The NJDEP NRDCSRS are identified as ARARs unless the NRDCSRS is based on inhalation risk calculations (such as the NRDCSRS for manganese). **Table 2** presents the cleanup goals established for site COCs. The cleanup goals are equal to the NJDEP NRDCSRS values unless the NRDCSRS value is an inhalation-based value. In that case, the USEPA IRSL value is used as the cleanup goal and noted in the table."
>
> page 9 of the PDF file: **Final 3 Site Proposed Plan 2014 08 26.pdf**
> page 6 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

Accordingly, I request additional clarification. Prudence requires that sufficient excavation occur to achieve conformity to responsible and safe standards for Manganese.

4. As for Thallium, it should be noted that Thallium forms an oxide when exposed to air. In the presence of water it forms a hydroxide. This element and its compounds are toxic.

> "The element and its compounds are toxic and should be carefully handled. Contact of the metal with the skin is dangerous, and when melting the metal, adequate ventilation should be provided… Thallium sulfate is widely employed as a rodenticide and ant killer. It is odorless and tasteless, giving no warning of its presence."
>
> page **B-33** of the CRC Handbook of Chemistry and Physics 53rd. Edition.

Therefore, it is to be expected that care will be taken to assure that sufficient excavation will occur at this site to result in its conformity to the state standards for Thallium – as well as for the other contaminants. Prudence requires that sufficient excavation occur to achieve conformity to responsible and safe standards for Thallium.

5. The possible presence of residual Uranium and/or its isotopes. Although Uranium is not included in the **CONTAMINANTS OF CONCERN** section (**Table 2 -** page 6 of the PP/page 9 of the PDF) that particular substance is specifically mentioned in the PDF file. The PP unequivocally references the onsite presence and/or use of Uranium:

> "Materials known to be used in wind tunnel operations included compressor oils, lubricating oils, and **uranium**-containing valves and gauges."
>
> page 6 of the PDF file: **Final 3 Site Proposed Plan 2014 08 26.pdf**
> page 3 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

Uranium will over time decay and transform itself into other usually radioactive substances while simultaneously emitting discrete amounts of energy in various forms. Therefore, one is logically compelled to ponder whether or not all of the Uranium – and/or all of the isotopes of Uranium – onsite have been properly accounted for. Have all of the radioactive decay products of that Uranium, if any, been adequately disposed of?

> "…**Uranium and its compounds are highly toxic**, both from a chemical and radiological standpoint. Finely divided uranium metal, being pyrophoric, presents a fire hazard…. "
>
> page **B-36** of the CRC Handbook of Chemistry and Physics 53rd. Edition.

Care should be taken to assure that sufficient excavation will occur to result in achieving conformity with responsible and safe standards for Uranium and/or its isotopes.

6. Excavate sufficiently to assure conformity to the state standards for all onsite contaminants.

7. Risks were typically calculated for exposure scenarios that only assumed the degree of exposure that one might reasonably expect for a worker actively engaged at the arsenal in industry, research, construction and/or maintenance.

> "Picatinny's Master Plan designates future use of Areas D, H, and I as military and industrial conducted in a secured area. There are no plans to change this land-use in the foreseeable future…"
>
> page 7 of the PDF file: **Final 3 Site Proposed Plan 2014 08 26.pdf**
> page 4 of the **Final Proposed Plan (PP) PICA 097, 131, and 149 (Sites 118, 131, and 149)**

However, it should be noted that a not inconsiderable amount of individuals actually reside on the premises of the arsenal, among them are the families of diverse military personnel and contractors. More residents may be expected to assume residence at the arsenal. Therefore, prudence dictates that where there is a likelihood that individuals will reside for extended time intervals greater than those typically expected for onsite workers, that sufficient excavation occur to achieve conformity to responsible and safe residential standards. In addition, the excavated materials must be safely transported from the arsenal to a properly accredited and maintained facility *elsewhere* that is designed to safely accommodate the contaminants.

IV. CONCLUSION

It is possible that significant new information will be disclosed during the public comment period and that the recommended response action will be modified. Accordingly, I herewith formally request that I be apprised of any significant changes to the PP if such should occur. Finally, since the USEPA is acknowledged to be the lead regulatory agency I am providing copies of my comments to the appropriate representatives of the NJDEP and the USEPA: USEPA – Mr. William Roach, NJDEP – Ms. Anne Pavelka.

For future reference, it should be noted that it was stated during the recent public hearing that the army's current environmental reclamation performance contractor, Arcadis, may soon be replaced with another firm. This may impact the army's evaluation and selection of remediation alternatives and it could conceivably inspire modifications of the PP. If so, then I respectfully suggest that all of the community members of the PAERAB be duly informed if and when this should occur.

In any event, the Army is required by statute to provide the public with a 30-day comment period during which suggestions and/or criticisms can be submitted: from September 11, 2014 to October 11, 2014. Accordingly, since I attended the public hearing on September 11, 2014 and because I have served the public for more than 20 years as a founding member of the PAERAB I herewith formally and respectfully submit this comment concerning the **Final 3 Site Proposed Plan for PICA 097, 131, and 149 (Sites 118, 131, and 149).**

Finally, I will provide you with an e-mail copy complete with appropriate attachments.

Sincerely,

Michael Glaab
PAERAB Community Representative (Jefferson Twp.)

CC:

Ms. Anne Pavelka
NJ Department of Environmental Protection
Bureau of Case Management
P.O. Box 028, Mail Code 401-05F
401 East State Street,
Trenton, NJ 08625-0028

Mr. William Roach
Remedial Project Manager - USEPA Region II
290 Broadway
New York, NY 10007-1866

Appendix F
NJDEP Proposed Plan Concurrence Letter
And
NJDEP Record of Decision Concurrence Letter

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State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Remediation Oversight Element
Mail Code 401-05A
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-984-1351

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

Mr. Ted Gabel
Project Manager for Environmental Restoration
Environmental Directorate, B319
U.S. Army IMA-NERO Garisson
Picatinny Arsenal. New Jersey 07806-5000

NOV 12 2014

Ms. Angela Carpenter, Chief
Special Projects Branch
USEPA Region 2
290 Broadway , 18th Floor
New York, NY 10007-1866

RE: Picatinny Arsenal
Rt. 15 North
Picatinny Arsenal, Morris County
PI# 008575

Dear Mr. Gabel and Ms. Carpenter:

The New Jersey Department of Environmental Protection (Department) has completed its review of the Proposed Plan dated August, 2014 for PICA-097, -131, -149 (Sites 118, 131 and 149) for soil at the Picatinny Arsenal Superfund Site, and concurs with the proposed remedy. The proposed remedy consists of excavation and off-site disposal of contaminated soil present at levels above New Jersey's Non Residential Direct Contact Soil Remediation Standards. The excavation will go to maximum depth of two feet. If contamination is present below two feet, then land use controls will be established in the Base Master Plan.

The Department looks forward to working with the Army and EPA on the issuance of the Record of Decision for further remediation at Picatinny Arsenal. Thank you for your cooperation in this matter. If you have any questions, call Anne Pavelka at 609-292-3007, or at Anne.Pavelka@dep.nj.gov.

Sincerely,

Wayne Howitz, Assistant Director
Remediation Oversight Element

C: William Roach, USEPA

State of New Jersey

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation and Waste Management Programs
Mail Code 401-06
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-292-1250

BOB MARTIN
Commissioner

August 25, 2017

Mr. John Prince, Acting Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency Region II
290 Broadway
New York, NY 10007-1866

Re: Facility Name: Picatinny Arsenal
Location/address: Route 15
Rockaway Twp., Morris County
SRP PI# 008575
RPC000010

Dear Mr. Prince:

The New Jersey Department of Environmental Protection (Department) has completed its review of the Record of Decision (ROD) for 3 Site Group (Sites 118 [PICA-097], 131[PICA-131] and 149 [PICA-149]) dated July, 2017.

The selected response action (SL- 4) for the 3 sites listed above is excavation and off-site disposal of contaminated soil and land use controls. This ROD was prepared by the US Army as the lead agency. The Department concurs with the selected remedy, namely Response Action SL-4: Removal, Off-Site Disposal and Land Use Controls.

The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the Administrative Record file for this site. The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

The remedy selected to address soil includes the following major components:

- Excavation of contaminated soil above the Department's Nonresidential Soil Remediation Standards;
- Off-site disposal of contaminated soil;
- Land use controls

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost effective, and uses permanent solutions to the maximum extent practicable.

The Department appreciates the opportunity to participate in the decision-making process to select an appropriate remedy. If you have any questions, please call me at 609-292-1250.

Sincerely,

Mark J. Pedersen, Assistant Commissioner
Site Remediation & Waste Management Program

CC: Maurice Migliarino, NJDEP
Mr. Ted Gabel, US Army
Sharon Hartzell, USEPA
Michael Dachisen, Mayor Rockaway Twp.
Peter Tabbot, Rockaway Twp. Health Department